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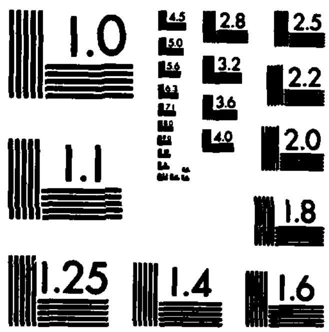

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

About 25 percent of the Doppler observations made on a Navy Navigation Satellite over a ten year period were analyzed to determine the motion of 10 sites on the North American plate and 13 sites on 7 other plates. The computed plate motions were not statistically significant compared with the standard errors of measurement of 1 to 5 cm/yr except for the Australian plate and Pacific plate. The measured motions of these plates are about twice those inferred from geologic records, but are in the proper direction. The Doppler derived 4 cm/yr northward motion of the African plate is

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marginally significant; this value is also twice that inferred from geologic records, but the discrepancy is not statistically significant.

Processing of the balance of the data on one satellite over the 10 year time interval would improve the accuracy of the determination by about a factor of two, improving the possibility of detecting additional statistically significant motions.

Unreasonable altitude changes at most sites are probably due to neglected higher order ionospheric refraction effects on the observations.

CONTENTS

INTRODUCTION

Daily Doppler observations of Navy Navigation Satellites are made by about 20 receivers operated by the Naval Astronautics Group ("OPNET" Stations), the Defense Mapping Agency ("TRANET" Stations) and cooperating international observations. The Naval Astronautics Group uses the observations made by its four receivers to compute the "broadcast ephemeris" which is injected in the satellite memory, transmitted in real time, and used for navigation and some geodetic applications. The Defense Mapping Agency uses the observations made by the entire station network to determine a "precise ephemeris" used in non-real time calculations of geodetic positions of portable receivers. Periodically, the base station network composed of the 20 receivers discussed above is supplemented by 10 to 15 portable receivers deployed primarily to obtain additional data on geodetic satellites such as the GEOS-3 or SEASAT-1 altimetry satellites. During these periods, one or two Navy Navigation Satellites are also observed by the portable equipment in order to calibrate their clocks and determine the receiver positions. On these occasions, the precise ephemerides are computed on the basis of the observations of the expanded station network.

The Naval Surface Weapons Center routinely computes the positions of the receivers in the base or expanded station network using the observations made on one Navy Navigation Satellite in order to monitor the stability of the coordinate system established by the precise ephemerides. Previous reports (Malyevac and Anderle, 1978) showed that the results of these computations were close to the precision required for plate tectonic studies, but that systematic errors existed in the results. A series of changes in operational and computational procedures was listed which could reduce the systematic errors. This report gives the results obtained after implementing some of the procedures.

SYSTEM CHANGES

The data discussed in this report were observed during the period 1973-1982. During this period, no significant changes were made in the force field used in the ephemeris computations and no intentional changes were made in the station coordinate system. When stations were added or antenna locations changed, the normal procedure is to compute a set of coordinates for the site which is consistent with the ephemeris. This procedure should maintain the consistency of the coordinate system defined by the ephemeris. One change made during this interval could have disturbed the coordinate system. In August, 1978, the coordinates of each station for each pass were added as parameters of the solution with a weight for the a-priori coordinates corresponding to an uncertainty of 1 m in each coordinate. The intention of this change was to recognize the error in the ephemeris due to force model errors so that observations with small standard errors will not overwhelm those which have errors which are somewhat larger, but still less than those corresponding to the ephemeris error. However, the effect of the change also tends to equalize any differences in strength of data which might exist in observing systems

such as portable equipment compared to base stations or TRANET stations versus OPNET stations. No significant change in the coordinate system was noted in tests conducted prior to the installation of the change, but subtle differences could have escaped detection.

Forty of the sites occupied during the period considered and for which results are given in this report are listed by plate and in numerical order in Table 1. The satellite subtracks observed by these sites at elevation angles above 10 degrees are shown in figure 1. The sites with five digit station numbers as well as station 127 in Shemya observed only intermittently during the latter portion of the time period covered. Although the results for these sites are not currently useful for crustal or plate tectonic studies due to the shorter occupation period, the combination of this data with data obtained in the future may produce useful results. In addition, other sites were occupied in Shemya and Sicily early in the period. If the terrestrial connections between the old and the new sites can be located, the results for these sites may be useful sooner. Although only limited data early in the time period are available for stations 195 (Palmer) and 196 (Casey) on the Antarctic continent, the data were processed in the event that survey markers at these important sites can be recovered and reoccupied in the future. The remaining 23 sites, which include 10 sites on the North American plate and 13 sites distributed among seven other plates provided data which is precise enough to determine useful bounds on plate motions, if systematic errors are not excessive. Three of the sites started operation somewhat after the beginning of the period considered in this report: Ottawa started in 1974, Florence in 1975 and Calgary also in 1975. Antennas at seven of the sites were moved during the time period. The changes in antenna locations in England in 1976, and from Maryland to Virginia in 1976 were large enough so that uncertainties in terrestrial connections could affect the accuracy of the results. The antenna changes in New Mexico in 1976, Alaska in 1976, Greenland in 1977, Ottawa in 1976 and Calgary in 1979 were small enough so that the accuracy of the results would not be affected if terrestrial connections between the old and new sites were made properly and if the ground plane effects on the signal are the same at the two sites. Of these five small changes, there is no evidence of difficulty in the survey records other than an uncertainty in an azimuth in Alaska which leads to an uncertainty in the East-West (actually 70° East of North) direction.

COMPUTATIONAL PROCEDURES

Satellite ephemerides were computed by the Defense Mapping Agency Hydrographic/Topographic Center at two day intervals and provided to the Naval Surface Weapons Center along with the pre-processed, filtered observations used in the computations. The parameters of the orbit fit included six constants of orbit integration, either one or two drag scaling factors depending on the level of solar activity, and the components of pole position for each orbit fit, and a frequency and tropospheric refraction scale parameter (with 10% uncertainty assigned to a-priori refraction) for each satellite pass over each station. Starting in August 1978, the coordinates of the station

TABLE 1. DOPPLER SITES OCCUPIED 1973-1982

PLATE INDEX	PLATE
1	NO AMERICA
2	SO AMERICA
3	PACIFIC
4	EURASIAN
5	PHILIPPINE
6	AUSTRALIAN
7	ANTARCTIC
8	AFRICAN
9	ARABIAN
10	NAZCA

STATIONS ON NO AMERICA PLATE

107	VIRGINIA
113	NEW MEXICO
192	TEXAS
310	MAINE
320	MINNESOTA
330	CALIFORNIA
31061	AUSTIN,TX.
128	OTTAWA
125	CALGARY
114	ALASKA
118	GREENLAND
127	SHEMYA
31039	CAMBR BAY
20200	KINGMAN
197	SHEMYA
31265	GARD.C.,TX
31266	WICH.F.,TX
31267	RAP.C.,SD
53210	UKIAH
31268	SIOUX C.IA
30602	VIRGINIA
28	OTTAWA
111	MARYLAND
351	PR.PATRICK
352	CAMBR. BAY
30967	BERMUDA

STATIONS ON SO AMERICA PLATE

8	BRAZIL
30121	QUITO
30122	ASUNSION
30200	SANTIAGO

STATIONS ON PACIFIC PLATE

340	HAWAII
24	SAMOA
30180	HAWAII
10212	MIDWAY
10214	KWAJELEIN
30969	TAHITI

STATIONS ON EURASIAN PLATE

27	JAPAN
30130	CYPRUS
30800	BANGKOK
20204	CATANIA
116	ENGLAND
21	BELGIUM
641	ITALY
350	CATANIA
13	MISAWA
16	ENGLAND
30966	AZORES

STATIONS ON PHILIPPINE PLATE

23	GUAM
22	PHILIPINES

STATIONS ON AUSTRALIAN PLATE

112	AUSTRALIA
30939	CHAGOS
30793	TOWNSVILLE
30968	PERTH

STATIONS ON ANTARCTIC PLATE

19	MCMURDO
195	PALMER
196	CASEY
30440	NAPIER

STATIONS ON AFRICAN PLATE

10068	ASCENSION
20	SEYCHELLES
30126	KINSHASA
30123	ST HELENA
105	SO AFRICA
30970	CANARY

STATIONS ON ARABIAN PLATE

31314	BAHRAIN

STATIONS ON NAZCA PLATE

30730	EASTER

	STATION	LOCATION			PLATE
1	8	BRAZIL	2	2	SO AMERICA
2	13	MISAWA	4	4	EURASIAN
3	16	ENGLAND	4	4	EURASIAN
4	19	MCMURDO	7	7	ANTARCTIC
5	20	SEYCHELLES	8	8	AFRICAN
6	21	BELGIUM	4	4	EURASIAN
7	22	PHILIPINES	5	5	PHILIPPINE
8	23	GUAM	5	5	PHILIPPINE
9	24	SAMOA	3	3	PACIFIC
10	27	JAPAN	4	4	EURASIAN
11	28	OTTAWA	1	1	NO AMERICA
12	105	SO AFRICA	8	8	AFRICAN
13	107	VIRGINIA	1	1	NO AMERICA
14	111	MARYLAND	1	1	NO AMERICA
15	112	AUSTRALIA	6	6	AUSTRALIAN
16	113	NEW MEXICO	1	1	NO AMERICA
17	114	ALASKA	1	1	NO AMERICA
18	116	ENGLAND	4	4	EURASIAN
19	118	GREENLAND	1	1	NO AMERICA
20	125	CALGARY	1	1	NO AMERICA
21	127	SHEMYA	1	1	NO AMERICA
22	128	OTTAWA	1	1	NO AMERICA
23	192	TEXAS	1	1	NO AMERICA
24	195	PALMER	7	7	ANTARCTIC
25	196	CASEY	7	7	ANTARCTIC
26	197	SHEMYA	1	1	NO AMERICA
27	310	MAINE	1	1	NO AMERICA
28	320	MINNESOTA	1	1	NO AMERICA
29	330	CALIFORNIA	1	1	NO AMERICA
30	340	HAWAII	3	3	PACIFIC
31	350	CATANIA	4	4	EURASIAN
32	351	PR.PATRICK	1	1	NO AMERICA
33	352	CAMBR. BAY	1	1	NO AMERICA
34	641	ITALY	4	4	EURASIAN
35	10068	ASCENSION	8	8	AFRICAN
36	10212	MIDWAY	3	3	PACIFIC
37	10214	KWAJELEIN	3	3	PACIFIC
38	20073	POLE SITE	20	20	ANT. ICE
39	20103	POLE	20	20	ANT. ICE
40	20200	KINGMAN	1	1	NO AMERICA
41	20204	CATANIA	4	4	EURASIAN
42	30121	QUITO	2	2	SO AMERICA
43	30122	ASUNSION	2	2	SO AMERICA
44	30123	ST HELENA	8	8	AFRICAN
45	30126	KINSHASA	8	8	AFRICAN
46	30130	CYPRUS	4	4	EURASIAN
47	30180	HAWAII	3	3	PACIFIC
48	30200	SANTIAGO	2	2	SO AMERICA
49	30440	NAPIER	7	7	ANTARCTIC
50	30602	VIRGINIA	1	1	NO AMERICA
51	30730	EASTER	10	10	NAZCA
52	30793	TOWNSVILLE	6	6	AUSTRALIAN
53	30800	BANGKOK	4	4	EURASIAN
54	30939	CHAGOS	6	6	AUSTRALIAN
55	30966	AZORES	4	4	EURASIAN
56	30967	BERMUDA	1	1	NO AMERICA
57	30968	PERTH	6	6	AUSTRALIAN
58	30969	TAHITI	3	3	PACIFIC
59	30970	CANARY	8	8	AFRICAN
60	31039	CAMBR BAY	1	1	NO AMERICA
61	31061	AUSTIN,TX.	1	1	NO AMERICA
62	31265	GARD.C.,TX	1	1	NO AMERICA
63	31266	WICH.F.,TX	1	1	NO AMERICA
64	31267	RAP.C.,SD	1	1	NO AMERICA
65	31268	SIOUX C.IA	1	1	NO AMERICA
66	31314	BAHRAIN	9	9	ARABIAN
67	53210	UKIAH	1	1	NO AMERICA

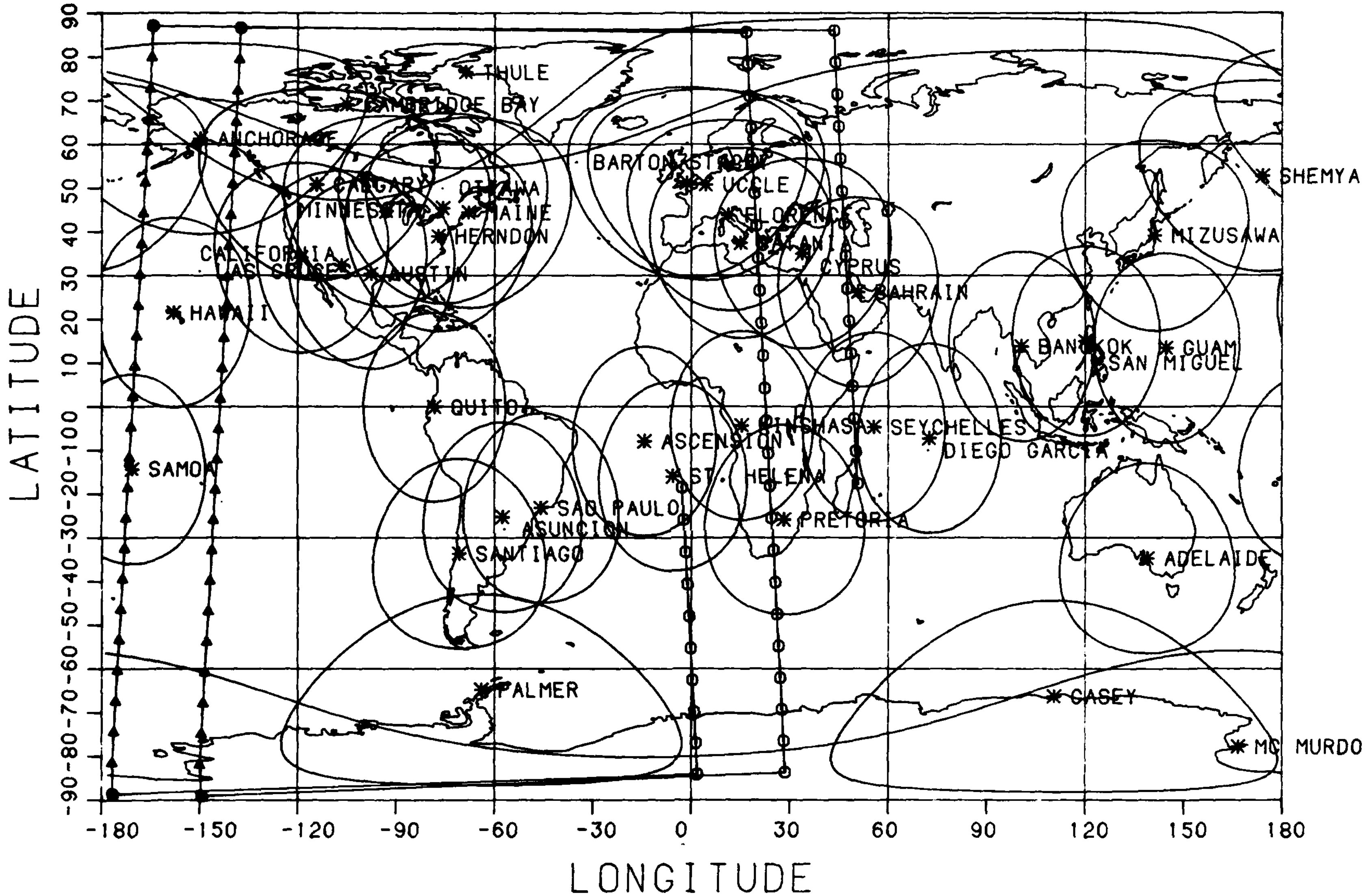


FIGURE 1. 10 DEGREE VISIBILITY CIRCLES AT DOPPLER SITES

for each pass of the satellite over each station were considered parameters of the solution with a one meter uncertainty assigned to the a-priori coordinate components. The coordinates of newly occupied stations were considered parameters of the solution until accurate coordinates could be computed.

These ephemerides and observations were used by the Naval Surface Weapons Center to compute the coordinates of the stations for time spans of observation of either five or thirteen days. The parameters of each solution included, in addition to the coordinates, a tropospheric refraction scaling factor, a frequency bias, and translation parameters for the satellite ephemeris for each pass of the satellite over each station. The a-priori refraction was assigned an uncertainty of 10% and the a-priori ephemeris components were assigned an uncertainty of one meter. A linear fit was made to the solutions for the coordinates of each station over the ten year time period, and solutions were rejected which differed from the line by more than 2.5 times the standard deviation of the fit. In addition to the linear fits to the data from each station, mean coordinates for each site were computed from the filtered solutions, and mean relative coordinates and linear fits to relative solutions for each pair of stations were computed on the basis of filtered solutions for common times. The fits were made considering equal weights for each solution and also using weights corresponding to the number of passes in each solution in order to represent the statistical strength of the thirteen day fits relative to the five day fits.

The computational procedures used in the analysis discussed in this report differed from those in a previous report (Anderle and Malyevac, 1978) in the following ways:

1. More recent data are included in the current report. The more recent data reduced the effect of antenna changes somewhat since a longer time span of data are now available with the most recent location. However, ionospheric effects are more severe in recent periods affecting the observations directly due to neglected third order ionospheric effects and indirectly in their effects on the atmospheric drag on the satellite.

2. Refraction scaling factor was considered for all data discussed in this report.

3. The orbit was considered exact in previous analysis but was assigned a one meter uncertainty in solutions discussed in this report. A study (Anderle, 1982) indicated the orbit relaxation improved the consistency of solutions somewhat even when the orbit uncertainty is independent for each pass over each station.

4. In this report the changes in relative station positions were computed from data observed concurrently by each station pair as well as from the total set of data observed by each station.

RESULTS

Graphs of the corrections to the nominal coordinates for each five or thirteen day set of data are given in Appendix A for each station. The source of the periodic variations in station heights has not been identified. The average increase in height may be due to increasing levels of solar activity which increase neglected third order ionospheric effects. The mean solutions are given in Table 2. Mean solutions for relative coordinates and the constants for the linear fits to relative coordinates are given in Appendix B. The rates of change of relative coordinates and the standard error of these rates are given in Appendix C while the residuals of fits for the constant fits and the linear fits are given in Appendix D. The relative rates and standard errors for those solutions where the standard errors are less than 10 cm/yr are summarized by datum in Appendix E for intra-datum relative motions of stations and in Appendix F for inter-datum motions.

The rates of change of latitude and longitude and the standard errors of those rates corresponding to the residuals of the linear fits are given in Table 3 for the 23 stations which provided the most data. The absolute rates are given in the left half of the table while the rates relative to Texas are given in the right half of the table. Texas was chosen as a reference because it was the only site in North America for which data were taken at only one antenna site throughout the ten year span considered. The relative motions are also shown in figure 2. The mean rates for each plate based on the Doppler satellite solution and based on the AM2 fit to geologic data by Minster and Jordan (1978) are given in Table 4, while the relative geologic rates are shown in figure 3. Although the signs of the average Doppler and geologic absolute motions happen to agree, the average Doppler absolute longitude rates should be zero for some data weighting because of a lack of absolute longitude reference. The strong tendency for negative rates indicates a gradual shift in the reference system due to antenna changes or some still undetected inconsistency between the satellite orbit computation and the station coordinate computation. (As mentioned earlier, the change in orbit computation procedure in August 1978 could conceivably introduce a reference system change.) It is therefore probably more meaningful to compare the rates relative to some plate, such as North America, as shown in the lower part of the Table.

The lower part of Table 4 shows that, relative to the North American plate, the Doppler derived motions of the Pacific plate in longitude, of the European plate in longitude and of the Australian plate in latitude are highly significant compared to the standard error of the solution. The latitude rate of the African plate is marginally significant. Considering the 1-5 cm/yr standard errors of the Doppler determinations, none of the components are significantly different from the geologic determinations except for the high latitude rate obtained for the Australian plate. However, all four statistically significant Doppler motions are about twice the geologic motions.

Although the Doppler satellite motions and geologic motions were determined for different time periods and different geographic positions, the higher Doppler rates could easily be due to either statistical variations or

TABLE 2. SOLUTIONS FOR MEAN STATION COORDINATES

STA	NO	PLATE	LOCATION	INITIAL COORDINATES LONGITUDE (DEG.E)	LATITUDE (DEG.N)	HEIGHT (KM)	CORRECTIONS LONG (M)	LAT (M)	HT (M)	CORRECTED COORDINATES LONGITUDE (DEG.E)	LATITUDE (DEG.N)	HEIGHT (KM)
1	8	2	BRAZIL	-45.8697970	-23.2175900	.60770	-.32	.22	.79	-45.8698017	-23.2175880	.60849
2	19	7	MCMURDO	166.6737930	-77.8476870	-.01540	-.40	.02	-.28	166.6737758	-77.8476868	-.01568
3	21	4	BELGIUM	4.3586340	50.7985810	.15060	-.37	.16	.98	4.3586288	50.7985824	.15158
4	23	5	GUAM	144.6343100	13.4397180	.08700	.23	-.01	1.81	144.6343121	13.4397179	.08881
5	24	3	SAMOA	-170.7160480	-14.3292790	.04150	-.32	-.29	.88	-170.7160509	-14.3292816	.04238
6	112	6	AUSTRALIA	138.6545610	-34.6739650	.03270	.20	.88	.60	138.6545632	-34.6739571	.03330
7	113	1	NEW MEXICO	-106.7541090	32.2787530	1.17521	.41	-.09	-.23	-106.7541047	32.2787522	1.17498
8	114	1	ALASKA	-149.8252000	61.2834040	.06970	.08	.05	.27	-149.8251986	61.2834044	.06997
9	118	1	GREENLAND	-68.7550900	76.5357640	.06150	.00	.60	.80	-68.7550899	76.5357693	.06230
10	192	1	TEXAS	-97.7256170	30.3835240	.21050	-.81	.02	1.07	-97.7256254	30.3835242	.21157
11	310	1	MAINE	-68.0124860	44.4044510	-.00920	-.01	-.48	.61	-68.0124861	44.4044467	-.00859
12	320	1	MINNESOTA	-93.0794980	44.7308890	.26210	.41	.31	.53	-93.0794928	44.7308918	.26264
13	330	1	CALIFORNIA	-119.0652710	34.1084360	.41750	.09	.15	1.66	-119.0652700	34.1084373	.41916
14	340	3	HAWAII	-157.9951540	21.5220740	.40980	-.60	-.42	2.08	-157.9951598	21.5220703	.41189
15	20	8	SEYCHELLES	55.4793670	-4.6706370	.54850	-.63	-.16	.41	55.4793613	-4.6706384	.54891
16	22	5	PHILIPINES	120.0723000	14.9878630	.05160	.40	.01	.48	120.0723037	14.9878630	.05208
17	105	8	SO AFRICA	28.3475060	-25.9468560	1.60331	-.23	.11	.15	28.3475037	-25.9468550	1.60346
18	195	7	PALMER	-64.0543480	-64.7743830	.02370	-2.20	.52	5.50	-64.0543943	-64.7743783	.02920
19	196	7	CASEY	110.5373060	-66.2789500	.00260	-.55	-1.48	1.36	110.5372937	-66.2789633	.00396
20	27	4	JAPAN	141.1331120	39.1351880	.11650	-.26	-.69	1.41	141.1331090	39.1351818	.11791
21	128	1	OTTAWA	-75.9190110	45.3998750	.04280	-.26	.29	-1.47	-75.9190143	45.3998776	.04133
22	641	4	ITALY	11.2307500	43.8037790	.13980	.00	-.07	.56	11.2307500	43.8037783	.14036
23	125	1	CALGARY	-114.2935420	50.8710070	1.24468	-1.39	-.66	.96	-114.2935617	50.8710011	1.24564
24	10068	8	ASCENSION	-14.4023060	-7.9078970	.04037	.78	.41	.27	-14.4022989	-7.9078933	.04064
25	30121	2	QUITO	-78.4203040	-.0977940	2.70639	-.32	.18	.27	-78.4203069	-.0977924	2.70666
26	30122	2	ASUNSION	-57.6131660	-25.3007070	.19180	.26	.67	-.67	-57.6131634	-25.3007010	.19113
27	30130	4	CYPRUS	33.7304570	35.0017350	.12064	.02	-.22	.76	33.7304572	35.0017330	.12140
28	30188	3	HAWAII	-157.9989760	21.3145420	.01306	.39	-.50	1.11	-157.9989722	21.3145375	.01416
29	30280	2	SANTIAGO	-70.8526220	-33.6240030	.44577	-.41	-.03	-.30	-70.8526264	-33.6240032	.44547
30	30800	4	BANGKOK	100.5945070	13.7925580	-.01990	-.19	.55	1.25	100.5945052	13.7925629	-.01865
31	20284	4	CATANIA	14.9375340	37.4058800	.05593	-.08	-.40	.42	14.9375331	37.4058764	.05635
32	30939	6	CHAGOS	72.3763290	-7.2635780	-.06376	1.49	-.51	1.32	72.3763425	-7.2635826	-.06244
33	30126	8	KINSHASA	15.2549010	-4.3704860	.45102	.35	.06	-.58	15.2549041	-4.3704855	.45044
34	30123	8	ST HELENA	-5.7168220	-15.9430960	.59877	1.66	1.08	.50	-5.7168065	-15.9430863	.59927
35	127	1	SHEMYA	174.1036160	52.7283230	.06560	-.77	-1.65	.97	174.1036066	52.7283082	.06657
36	107	1	VIRGINIA	-77.3133890	38.9953640	.07920	1.00	1.43	-.30	-77.3133774	38.9953768	.07890
37	116	4	ENGLAND	-1.3814860	51.1845660	.11840	.64	.12	-.21	-1.3814769	51.1845671	.11819
38	31061	1	AUSTIN,TX.	-97.7256460	30.3836330	.21088	1.16	-.97	-.93	-97.7256339	30.3836243	.20995
39	31039	1	CAMBR BAY	-105.1211590	69.1178070	-.00206	.04	-.97	1.26	-105.1211579	69.1177983	-.00080
40	31314	9	BAHRAIN	50.6083860	26.2095920	-.02025	1.24	.05	.10	50.6083984	26.2095925	-.02015

DOPPLER NAVSAT SOLUTION NSWC820907

WITH RESPECT TO ELLIPSOID HAVING
FLATTENING=1./298.25
SEMI MAJOR AXIS=6378145M

TABLE 3. COMPARISON OF ABSOLUTE AND RELATIVE RATES (CM/YR)

	ABSOLUTE				RELATIVE TO TEXAS			
	RATES		STD ERR		RATES		STD ERR	
	LONG	LAT	LONG	LAT	LONG	LAT	LONG	LAT
NORTH AMERICA								
Virginia	-3.3	-3.8	6.1	4.8	11.9	5.2	12.2	8.1
New Mexico	-0.2	1.7	1.3	1.1	6.5	-4.5	3.1	2.4
Alaska	-6.3	-9.4	1.5	1.3	-1.5	-15.5	3.3	2.6
Greenland	10.2	6.6	3.1	2.8	16.8	-0.3	4.7	4.3
Texas	-4.5	7.5	3.0	2.1	--	--	--	--
Maine	-4.6	-2.2	2.0	1.3	3.7	-8.8	3.5	2.7
Minnesota	-9.5	4.9	1.9	1.3	-3.4	-1.1	3.3	2.5
California	-7.4	7.1	1.6	1.2	-2.1	0.4	3.2	2.4
Ottawa	-7.0	8.9	5.2	4.5	-13.1	-0.4	7.7	5.9
Calgary	-37.4	-5.3	5.6	3.2	-41.6	-7.8	9.5	6.6
EURASIA								
Belgium	1.0	2.5	1.6	1.2	5.9	-4.9	3.6	2.3
Japan	-2.9	-7.3	2.7	2.3	-4.7	-16.1	4.4	3.5
England	6.3	-10.9	8.3	6.1	11.8	-15.1	15.0	9.6
Italy	22.4	6.9	5.1	4.0	3.4	-12.1	7.7	5.4
AFRICA								
S. Africa	-0.4	9.1	1.5	1.5	8.1	1.9	3.6	2.9
Seychelles	-8.2	-4.1	3.7	2.6	9.2	-14.9	6.4	4.7
PACIFIC								
Samoa	-18.3	7.6	3.2	2.3	-11.5	2.6	4.3	3.4
Hawaii	-13.7	-1.9	2.5	1.7	-6.3	-7.9	3.2	3.0
PHILIPPINE								
Philippines	0.9	-1.6	2.5	2.3	13.9	-5.5	5.0	4.8
Guam	-8.5	0.3	2.6	2.0	-4.0	-4.9	4.1	3.2
AUSTRALIA								
Adelaide	-5.5	17.0	1.5	1.6	1.0	10.7	3.3	2.4
ANTARCTICA								
McMurdo	-1.3	0.7	4.1	4.1	10.5	-5.3	5.9	5.8
SOUTH AFRICA								
Brazil	-4.1	4.0	2.8	1.9	0.5	-1.9	4.7	3.1

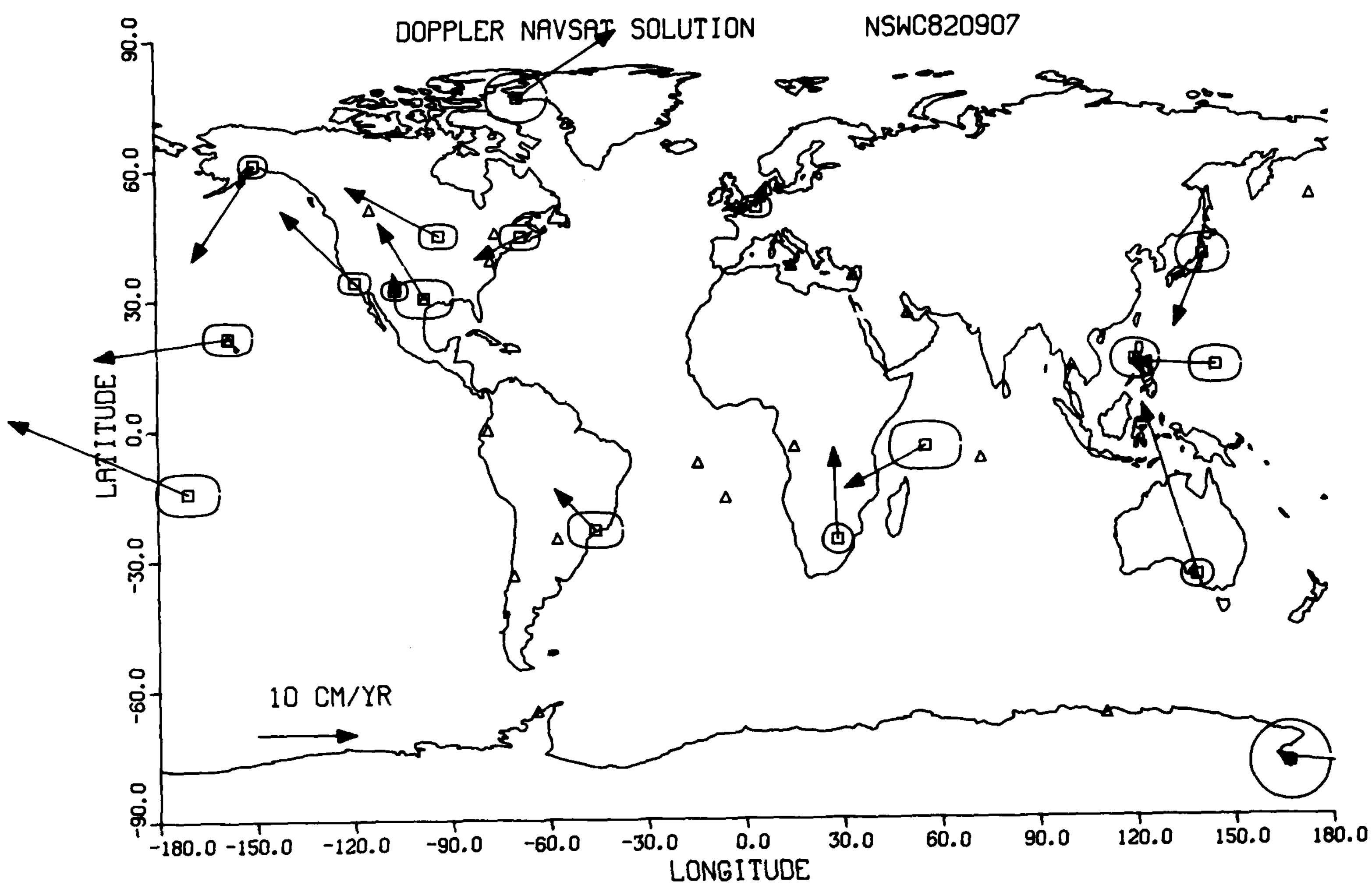


FIGURE 2. ABSOLUTE PLATE MOTIONS (CM/YR)

TABLE 4. PLATE MOTIONS (CM/YR)

		ABSOLUTE MOTIONS DOPPLER SATELLITE				GEOLOGIC RATES	
		RATES		STD ERR			
PLATE	NO. SITES	LONG	LAT	LONG	LAT	LONG	LAT
NO. AMERICAN	10	-4.7	1.2	0.7	0.5	-2.1	-1.1
SO. AMERICAN	1	-4.1	4.0	2.8	1.9	-3.0	-0.4
PACIFIC	3	-14.7	2.3	1.9	1.3	-8.8	5.0
EURASIAN	6	1.5	0.8	1.2	0.9	-0.1	0.2
PHILIPPINE	2	-3.5	-0.5	1.8	1.5	--	--
AUSTRALIAN	1	-5.5	17.0	1.5	1.6	1.2	7.3
ANTARCTIC	1	-1.3	0.7	4.1	4.1	0.0	0.6
AFRICAN	2	-1.5	5.6	1.4	1.3	0.7	1.3
		RELATIVE TO NORTH AMERICAN					
SO. AMERICAN	1	0.6	2.8	3.0	2.0	-0.9	0.7
PACIFIC	3	-10.0	1.1	2.1	1.5	-6.7	6.1
EURASIAN	6	6.2	-0.4	1.5	1.1	2.0	1.3
PHILIPPINE	2	1.2	-1.7	1.9	1.6	--	--
AUSTRALIAN	1	-0.8	15.8	1.7	1.8	3.3	8.4
ANTARCTIC	1	3.4	-0.5	4.3	4.7	2.1	1.7
AFRICAN	2	3.2	4.4	1.6	1.4	2.8	2.4

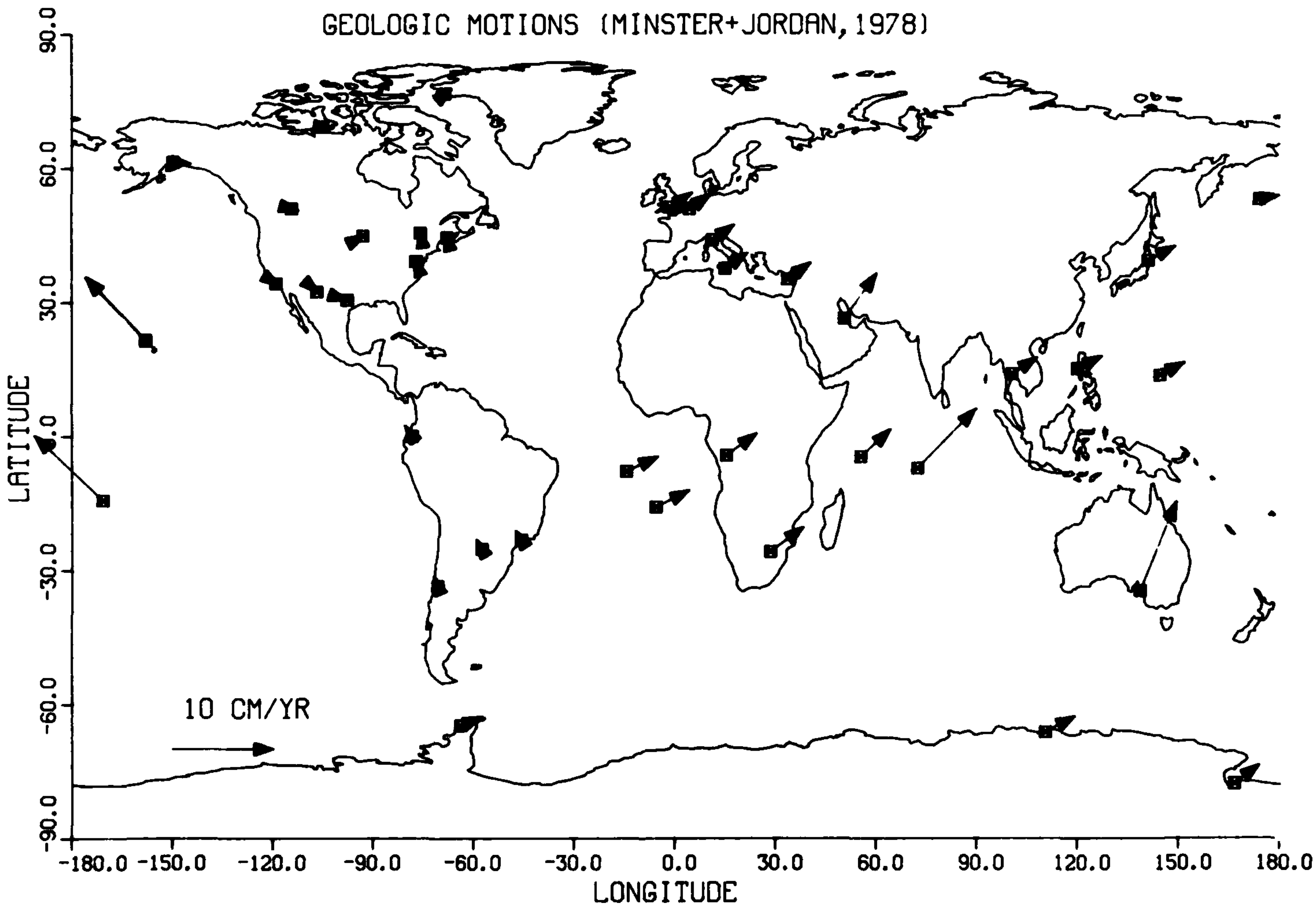


FIGURE 3. STATION MOTIONS RELATIVE TO TEXAS

systematic errors in the Doppler results, or a combination of both. Table 3 shows a number of instances where differences in the rates of different sites within the same datum are unreasonable considering the standard errors and the rigidity of the plates. Some of the discrepancies may be due to changes in antenna locations and others due to overly optimistic standard errors. The standard errors can be optimistic because the data are not evenly distributed over the ten year span of the linear fit. Appendix A shows that the preponderance of the data used in this study was observed in 1980 and 1981. Therefore the residuals of the linear fit, used to compute the standard errors, will not reflect longer period variations in station positions. Appendix B also shows large annual variations in station heights. The computed rates of the station heights were generally unreasonably large, with the majority in the range of 10 to 30 cm/yr. These results indicate systematic errors in the Doppler system, probably due to neglected higher order ionospheric effects (Clynch and Renfro, 1982), which might also affect horizontal positions.

PROSPECTS FOR THE FUTURE

Only about 25 percent of the data observed for one satellite during the ten year period was processed to determine the results given in this report. Processing of the remaining data for this satellite during the period should reduce the standard errors of the results by a factor of two, which might produce additional statistically significant results. The more complete data set will allow tests to be performed to determine whether antenna changes cause discontinuity in the results, and whether the motion of sites is continuous over the time period or correlated with a change in ephemeris computation procedure. In future years, firmer results will be available for the Eurasian plate and additional sites will provide data on other plates such as the Australian and South American plate.

REFERENCES

Malyevac, Carol and Richard J. Anderle, "Determination of Plate Tectonic Motion from Doppler Observations of Navy Navigation Satellites", Proceedings of the Second International Geodetic Symposium on Satellite Doppler Positioning, University of Texas at Austin, January 1979, pp. 695-742.

Minster, J. Bernard and Thomas H. Jordan, "Present-Day Plate Motions", Journal of Geophysical Research 83 (B11), 10 November 1978, pp. 5331-5354.

Clynch, James R. and Brent A. Renfro, "Evaluation of Ionospheric Residual Range Error", Proceedings of 3rd International Geodetic Symposium on Satellite Doppler Positioning, New Mexico State University, in press.

APPENDIX A

GRAPHS OF STATION COORDINATE CORRECTIONS

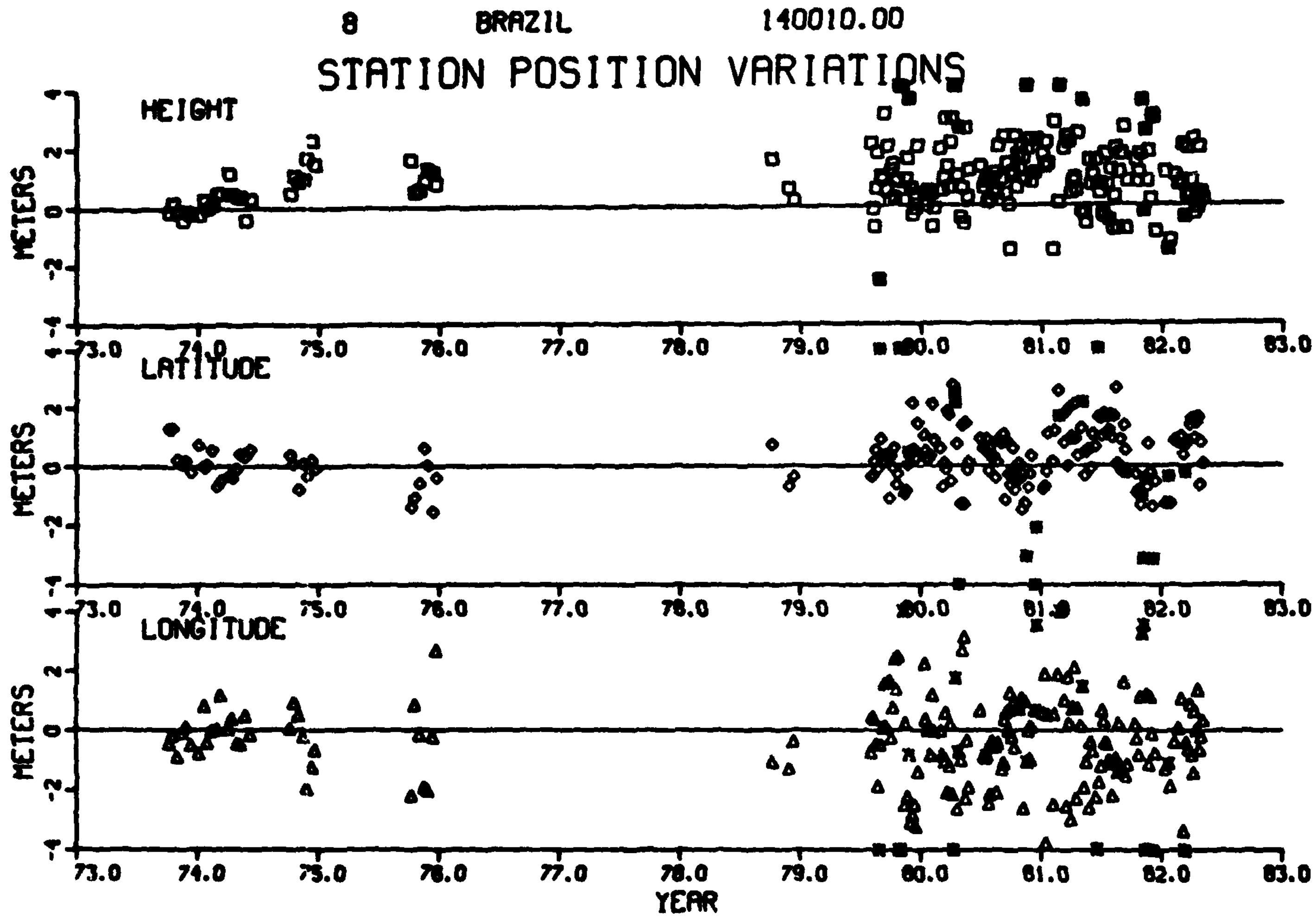
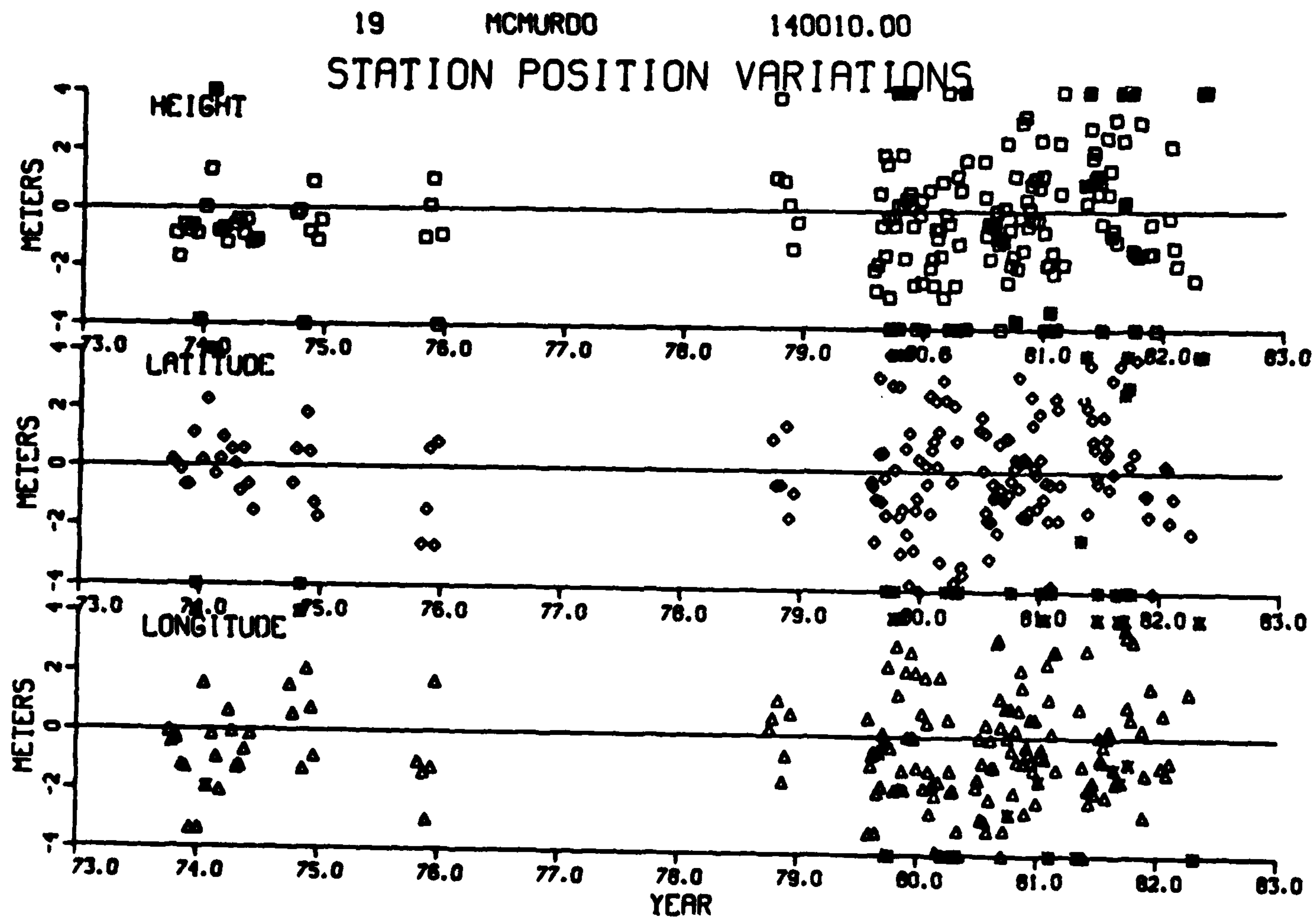

8 BRAZIL 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0

FIGURE A-1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HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
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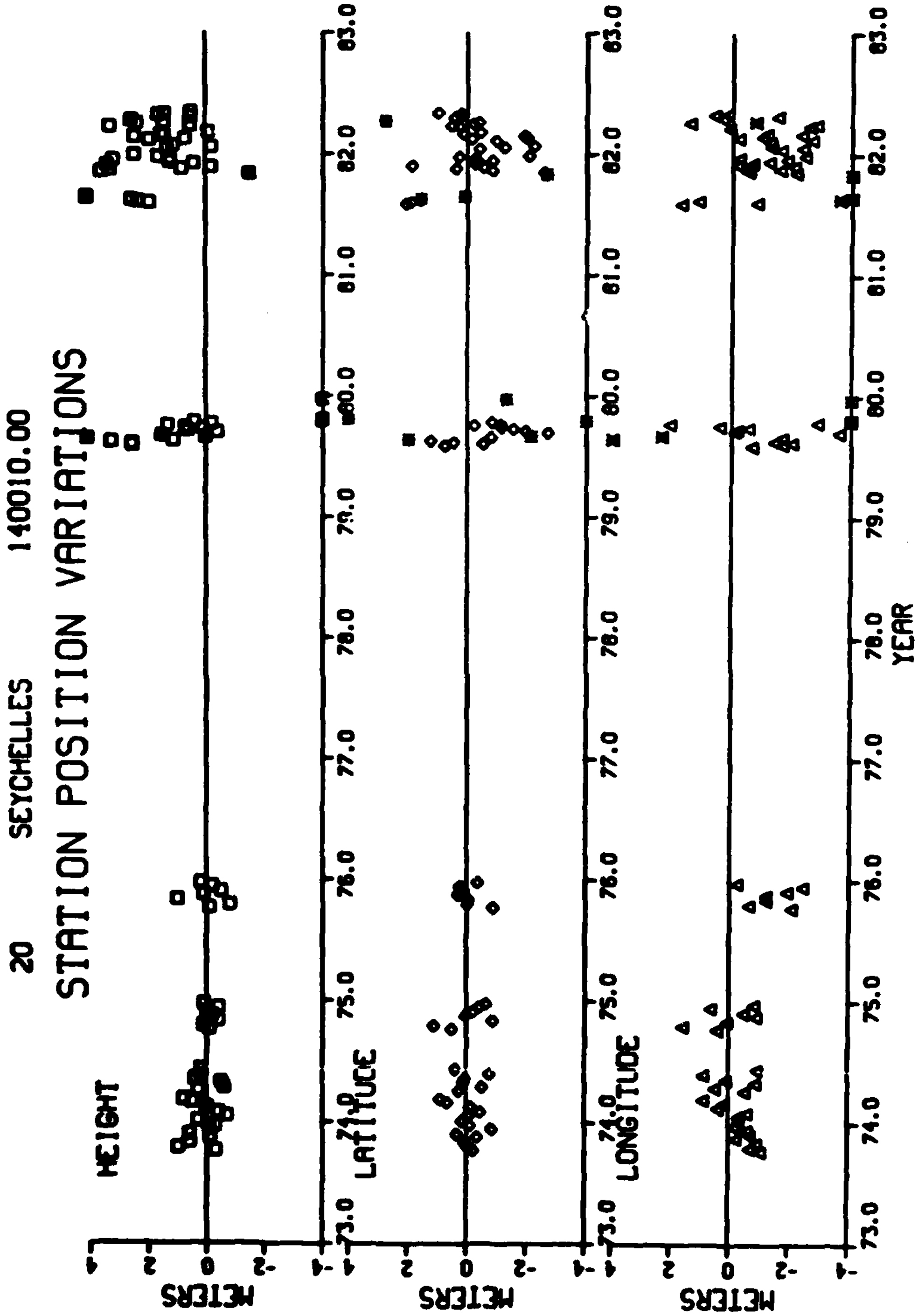
81.0
82.0
83.0

FIGURE A-2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HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
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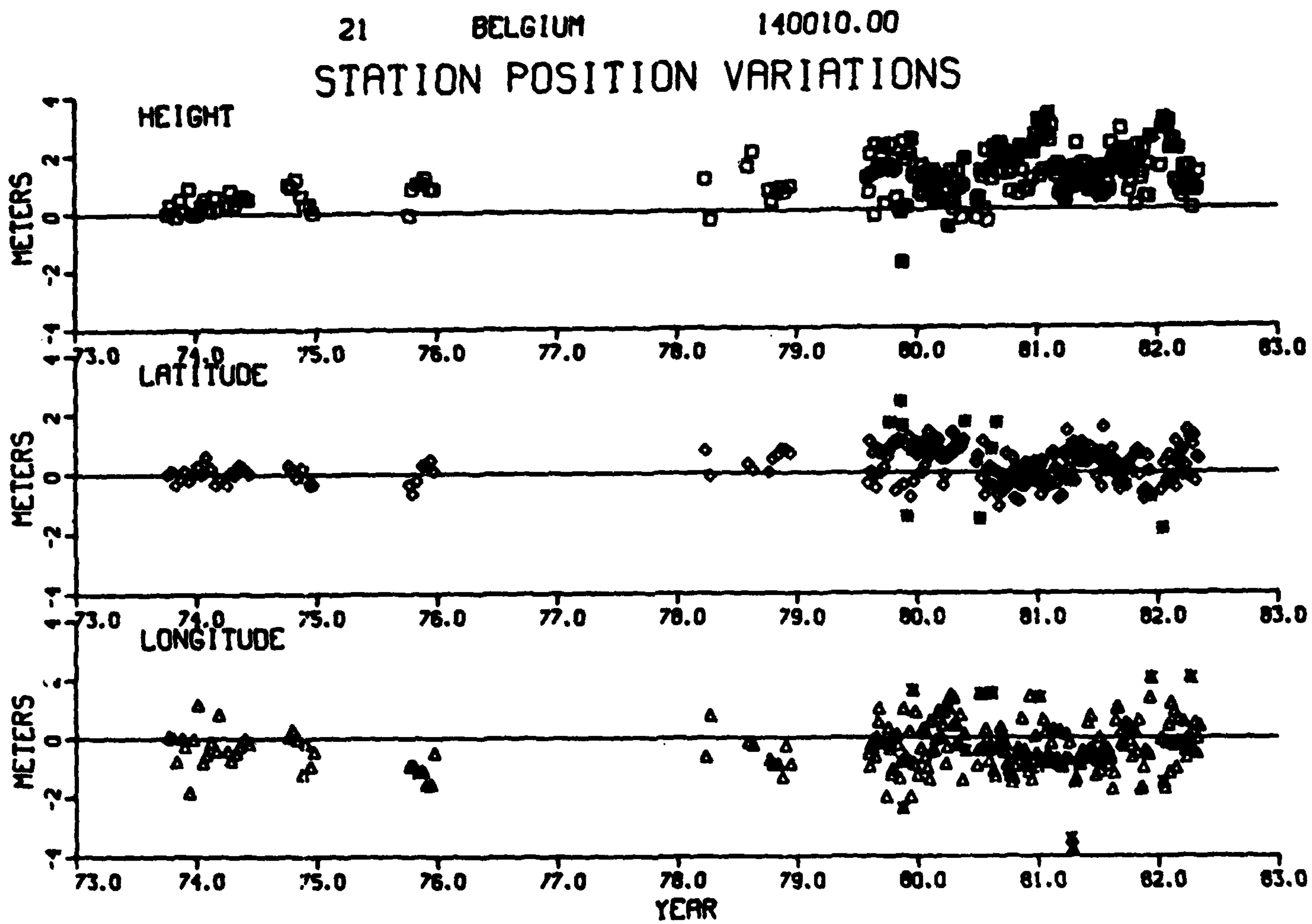
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0

FIGURE A-3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STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
4
2
0
-2
-4
73.0
74.0
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76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-4

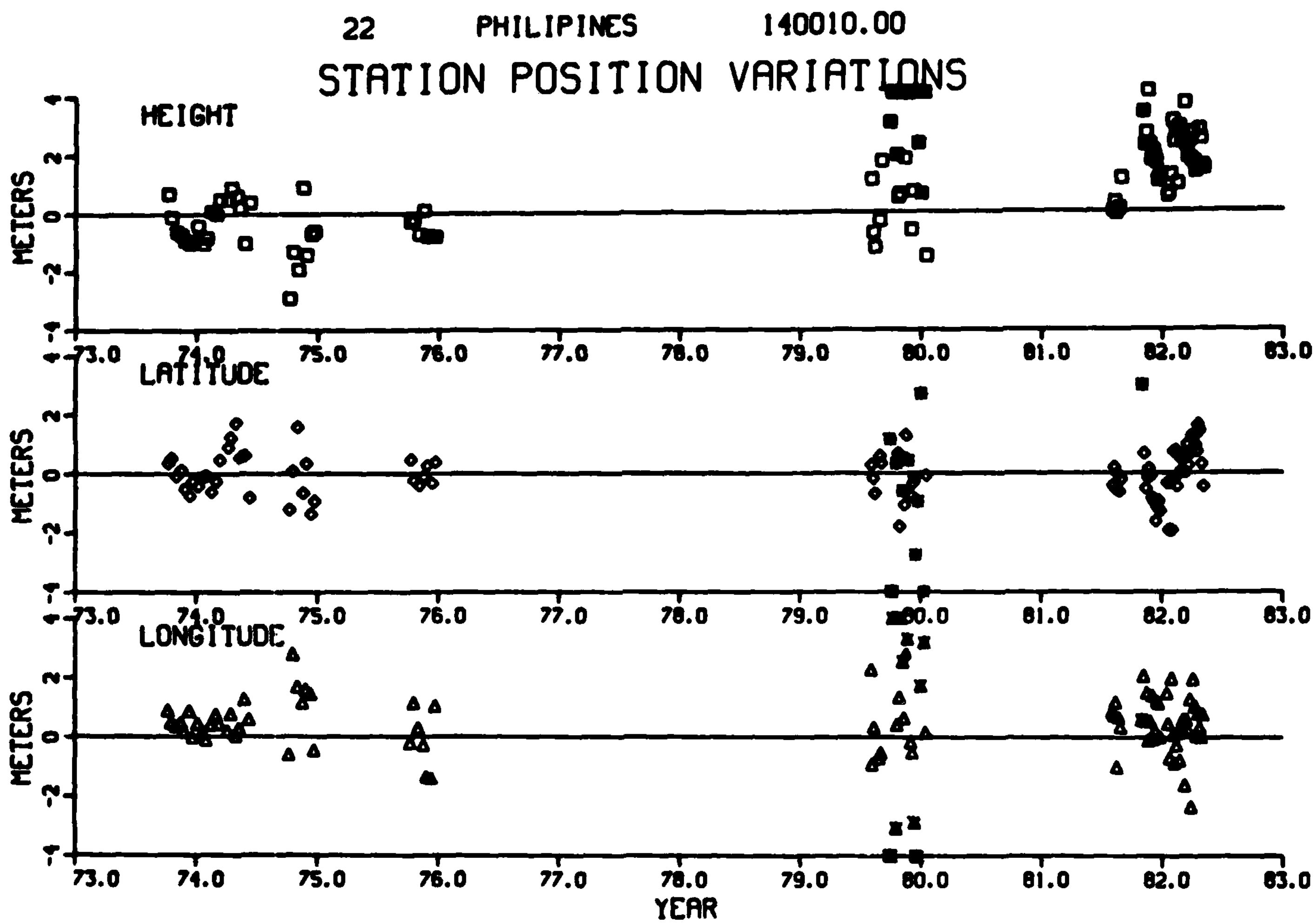
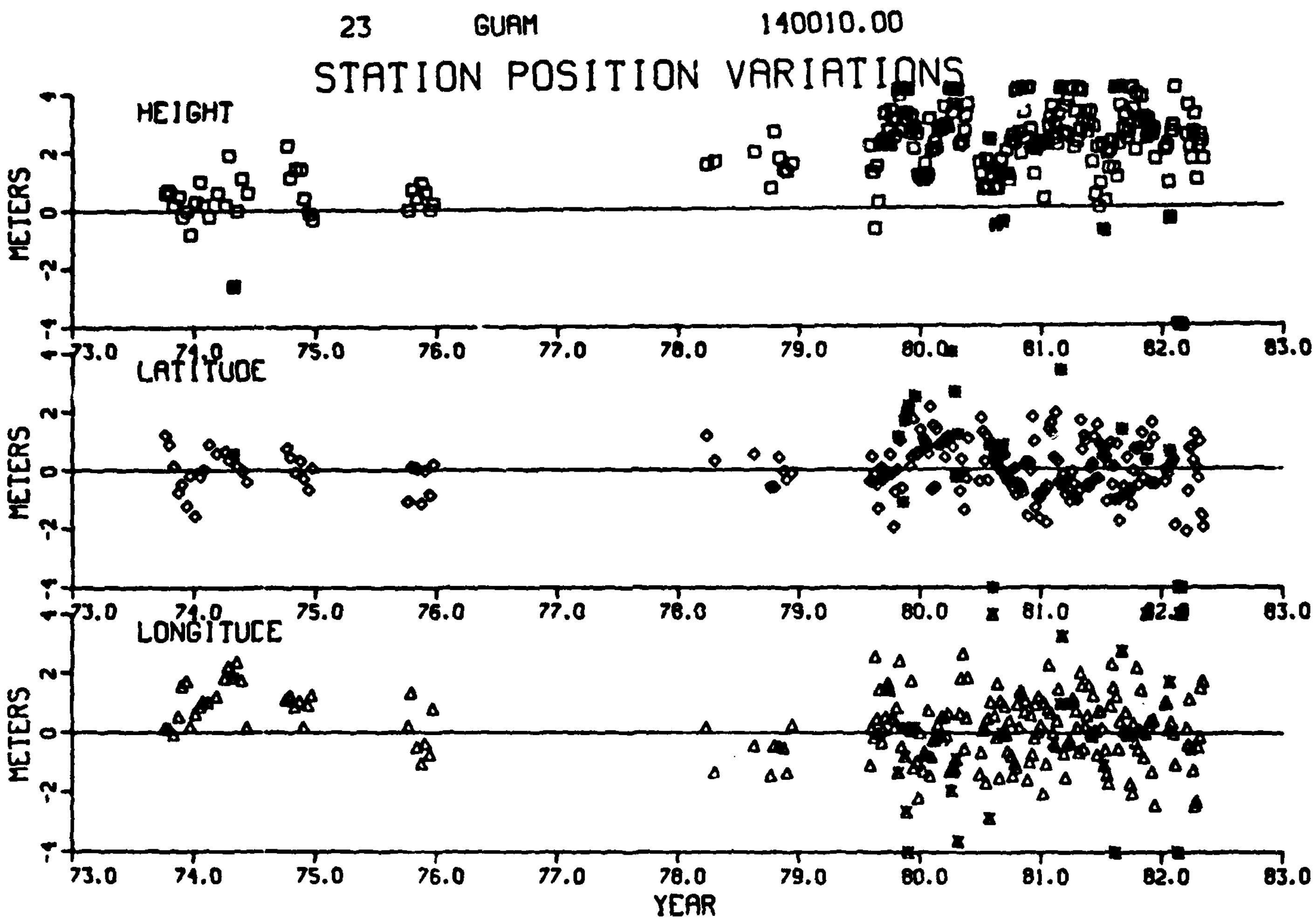

22 PHILIPINES 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
73.0 74.0 75.0 76.0 77.0 78.0 79.0 80.0 81.0 82.0 83.0

FIGURE A-5



23 GUAM 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUCE
METERS
YEAR
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74.0
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76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0

FIGURE A-6

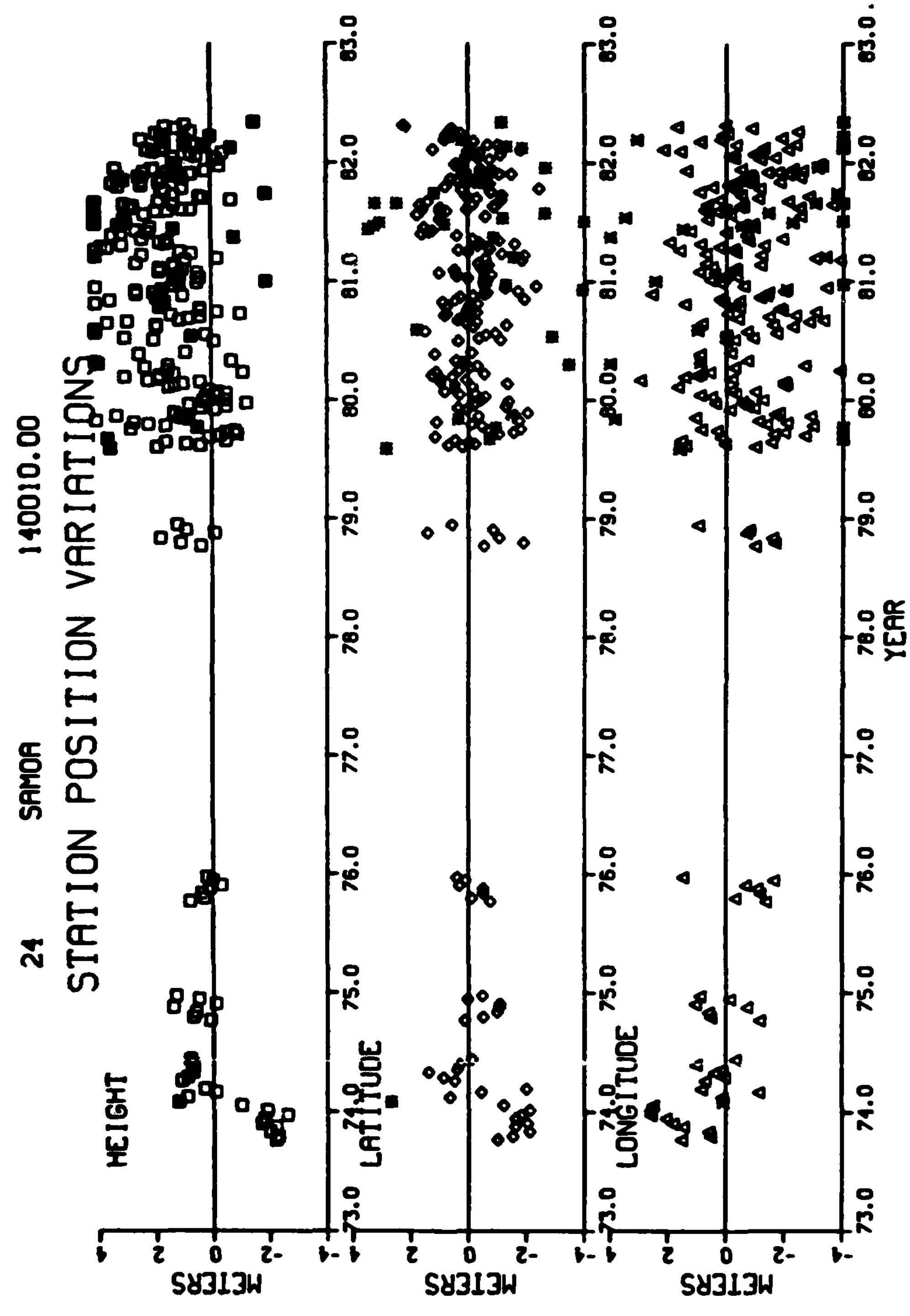
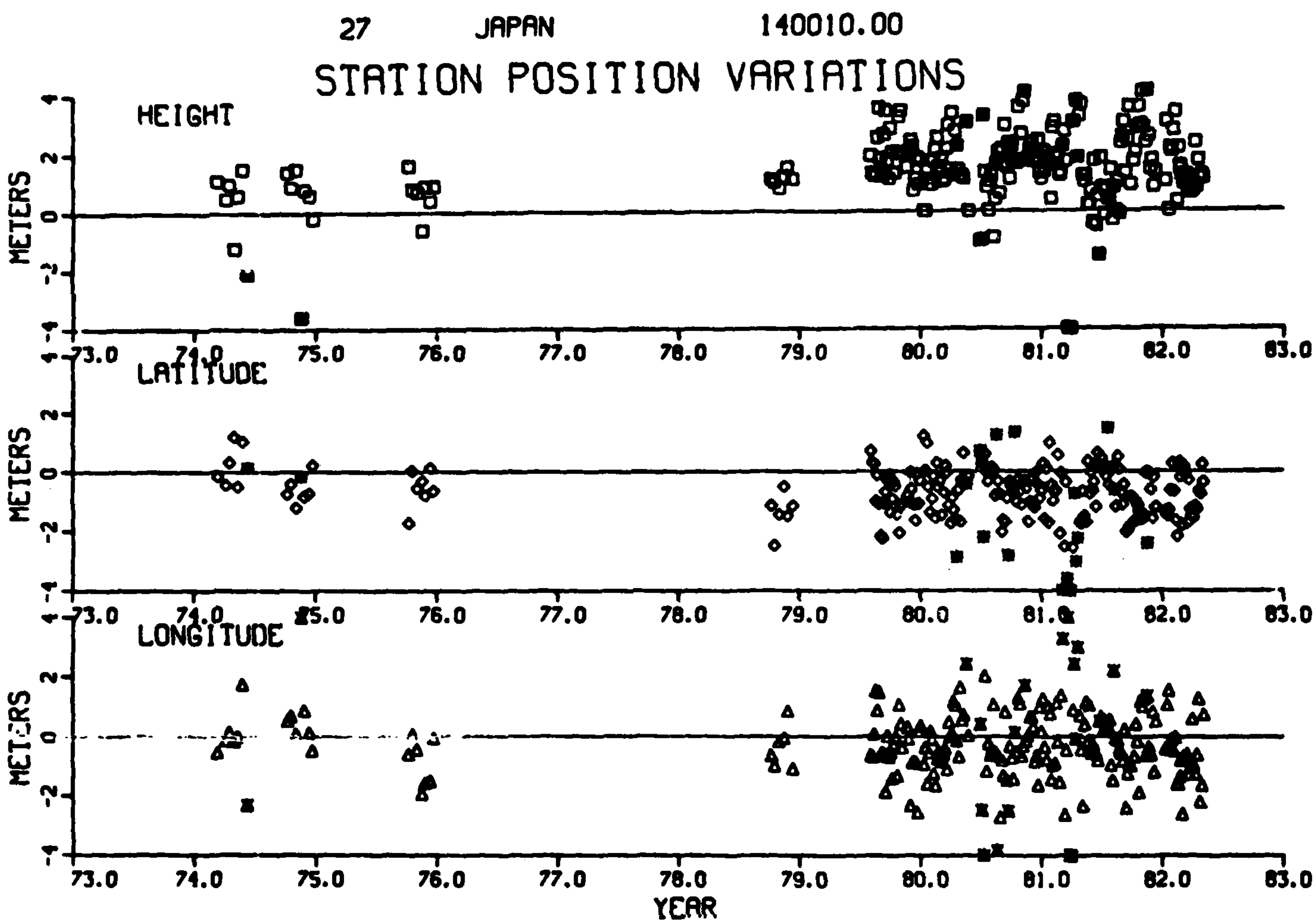
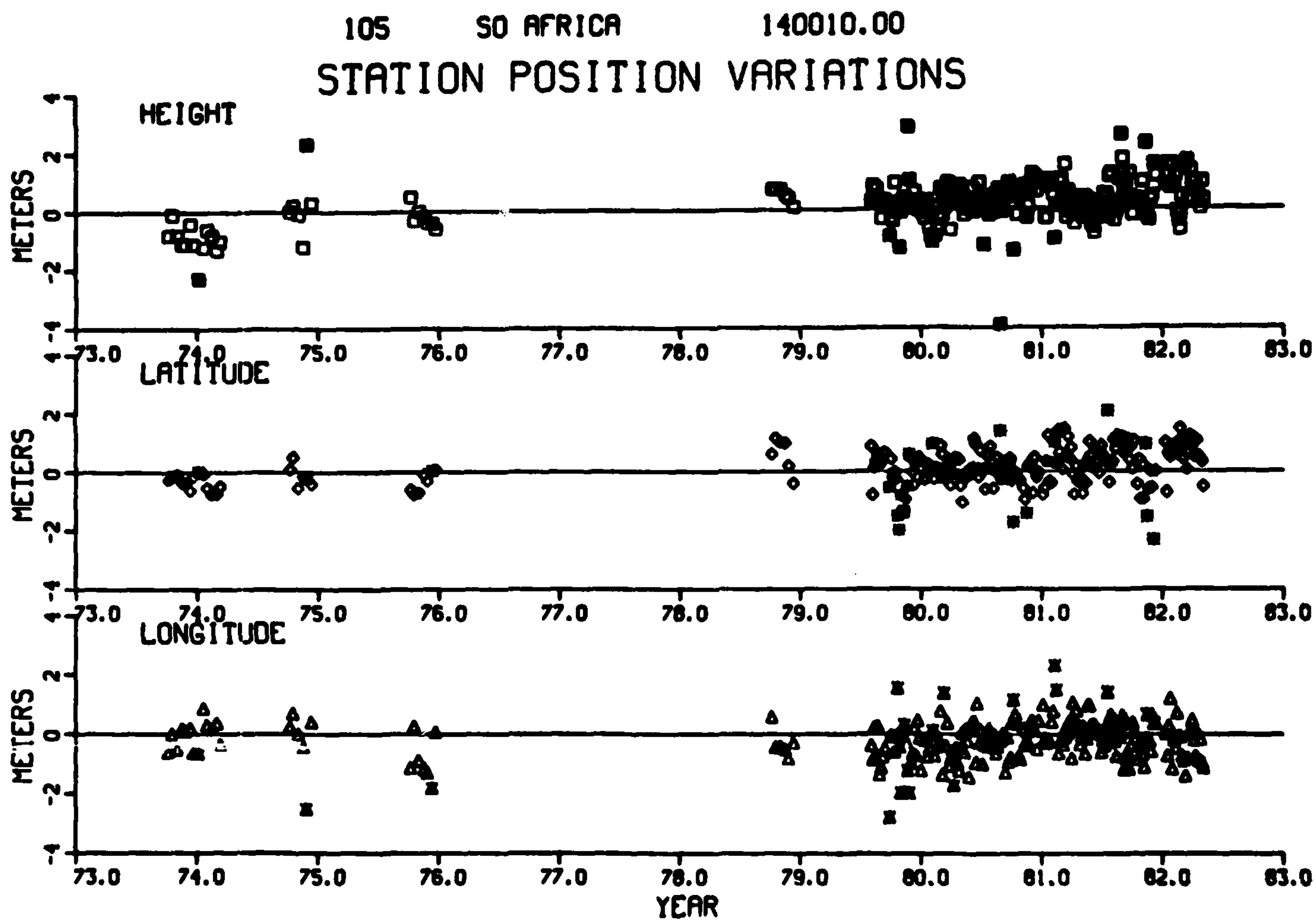

24 SAMOA 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR

FIGURE A-7



27
JAPAN
140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
YEAR

FIGURE A-8



105 SO AFRICA 140010.00
STATION POSITION VARIATIONS
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LATITUDE
LONGITUDE
METERS
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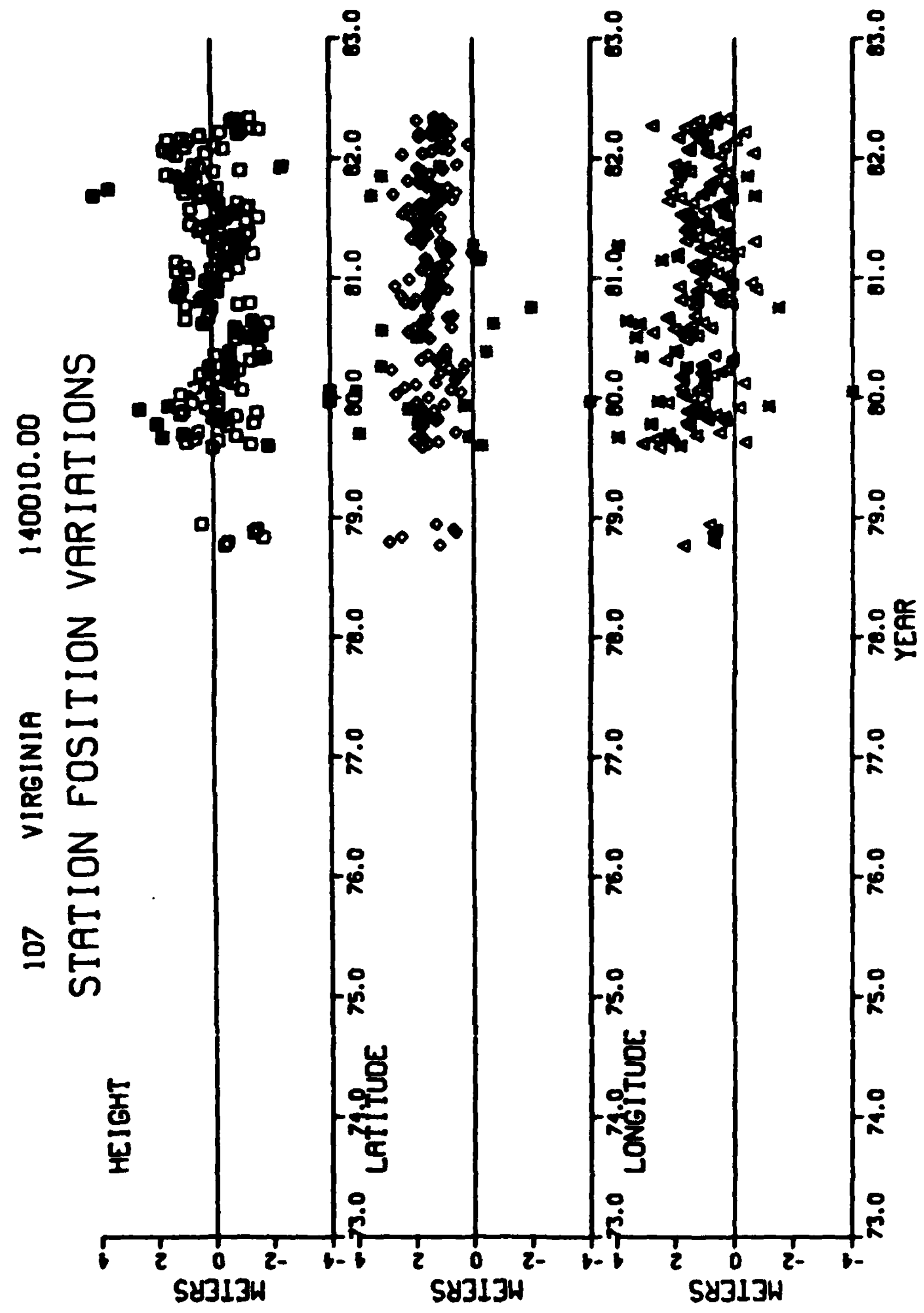
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-9



107 VIRGINIA 140010.00
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HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
YEAR
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74.0
75.0
76.0
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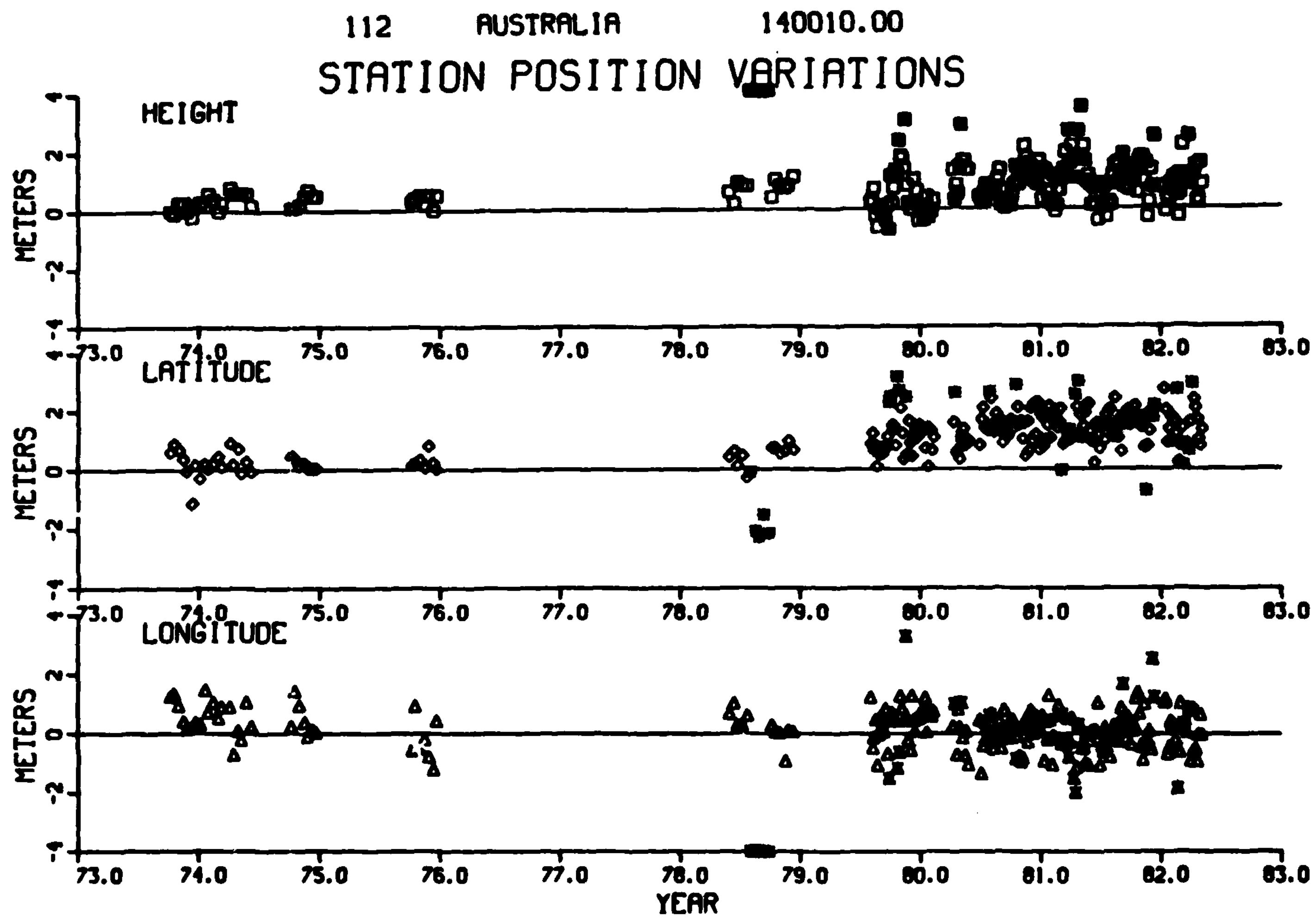
80.0
81.0
82.0
83.0
4
2
0
-2
-4

FIGURE A-10



112 AUSTRALIA 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
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2
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-2
-4
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74.0
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80.0
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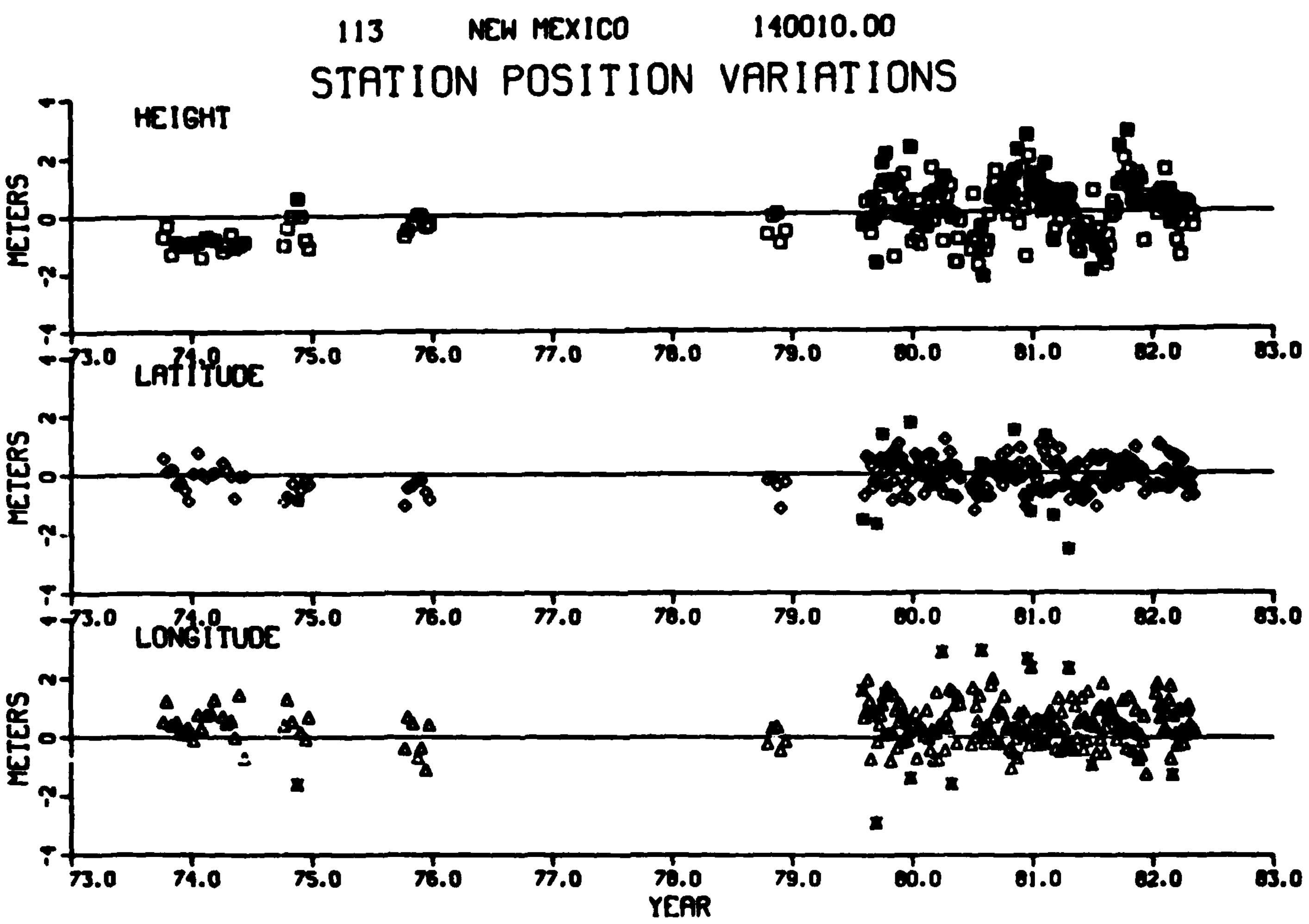
82.0
83.0
YEAR

FIGURE A-11



113 NEW MEXICO 140010.00
STATION POSITION VARIATIONS
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LATITUDE
LONGITUDE
METERS
YEAR
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81.0
82.0
83.0

FIGURE A-12

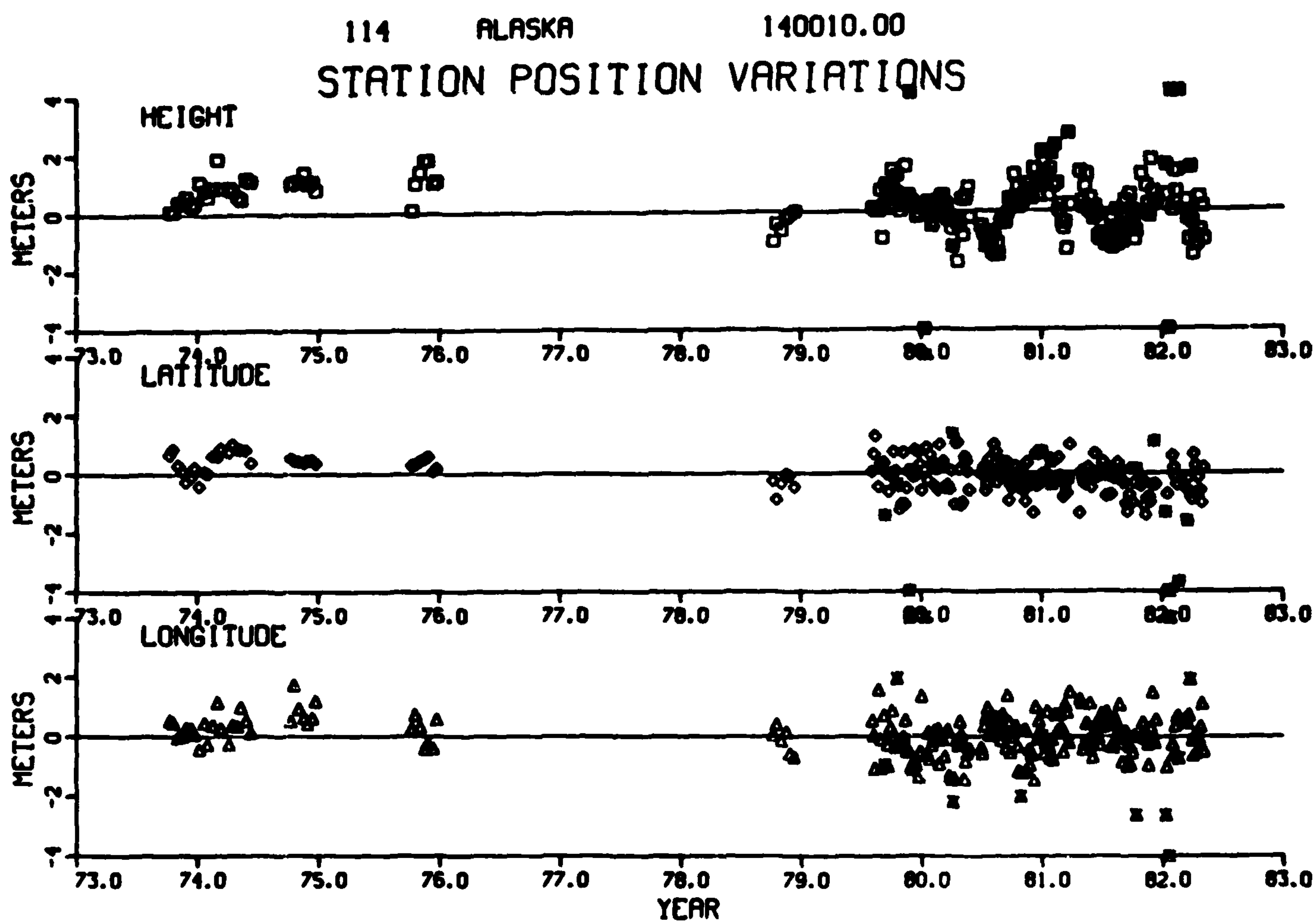
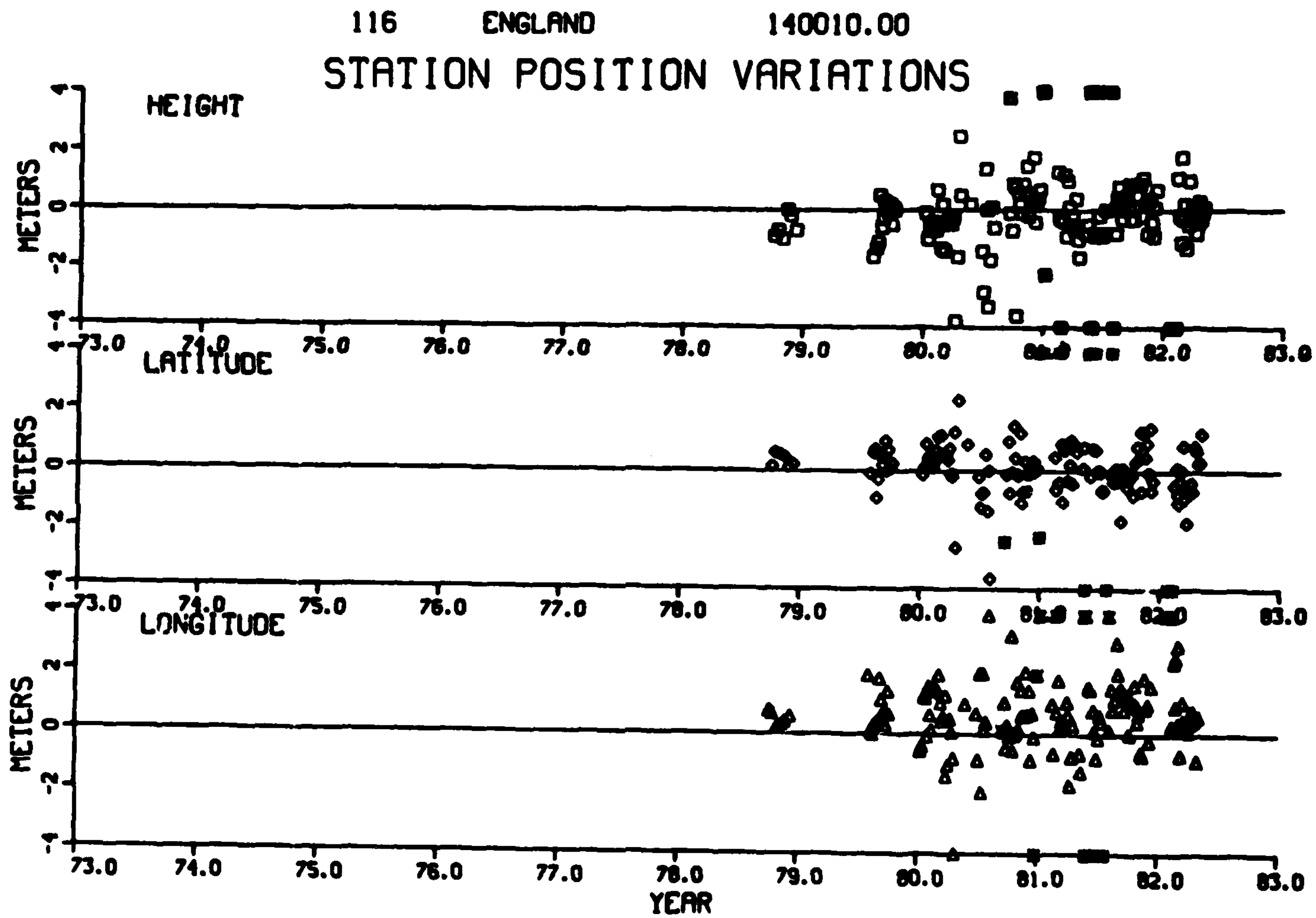

114 ALASKA 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR

FIGURE A-13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LATITUDE
LONGITUDE
METERS
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0
-2
-4
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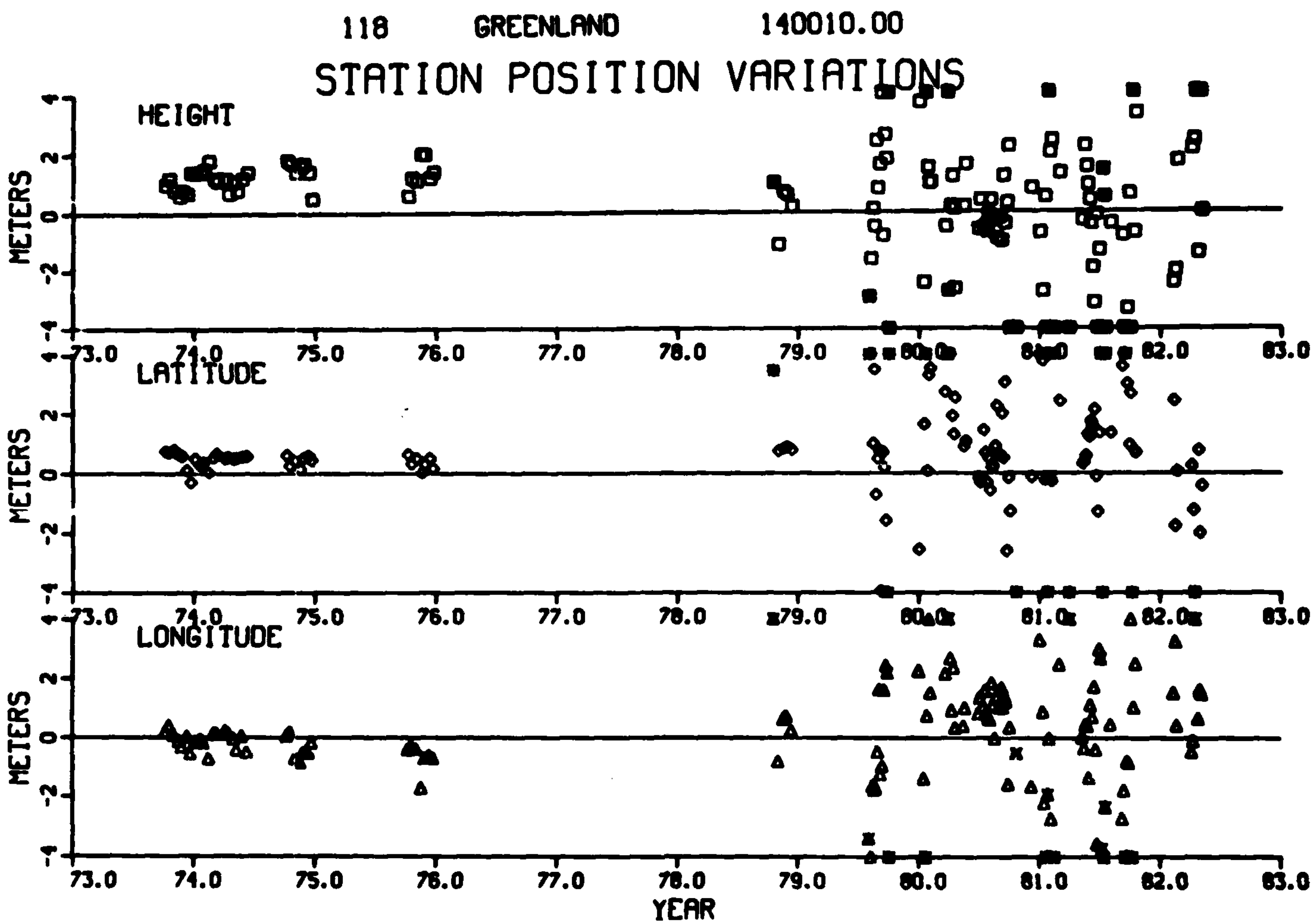
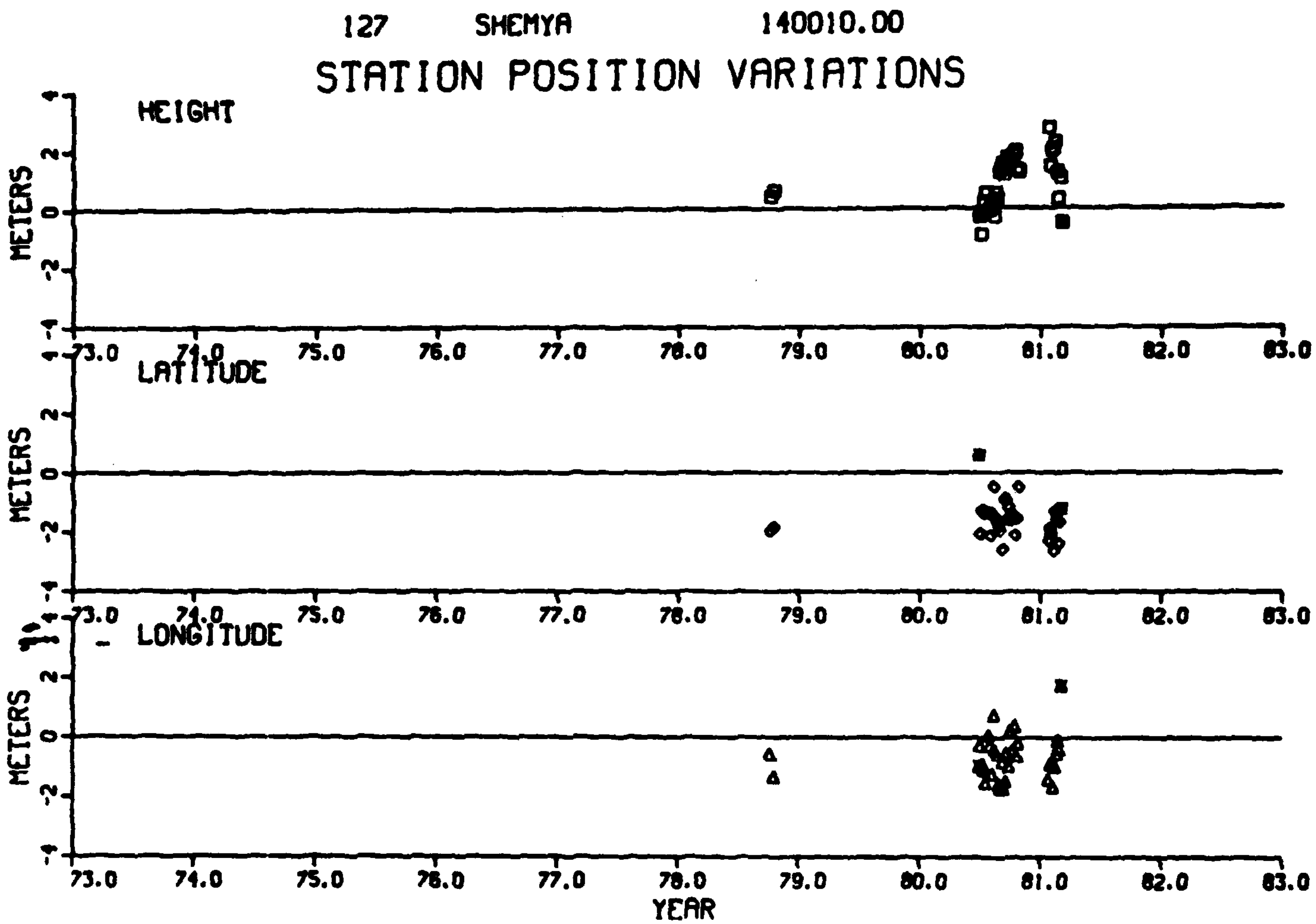
82.0
83.0
YEAR

FIGURE A-14



118 GREENLAND 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR

FIGURE A-15



127 SHEMYA 140010.00
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LONGITUDE
METERS
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80.0
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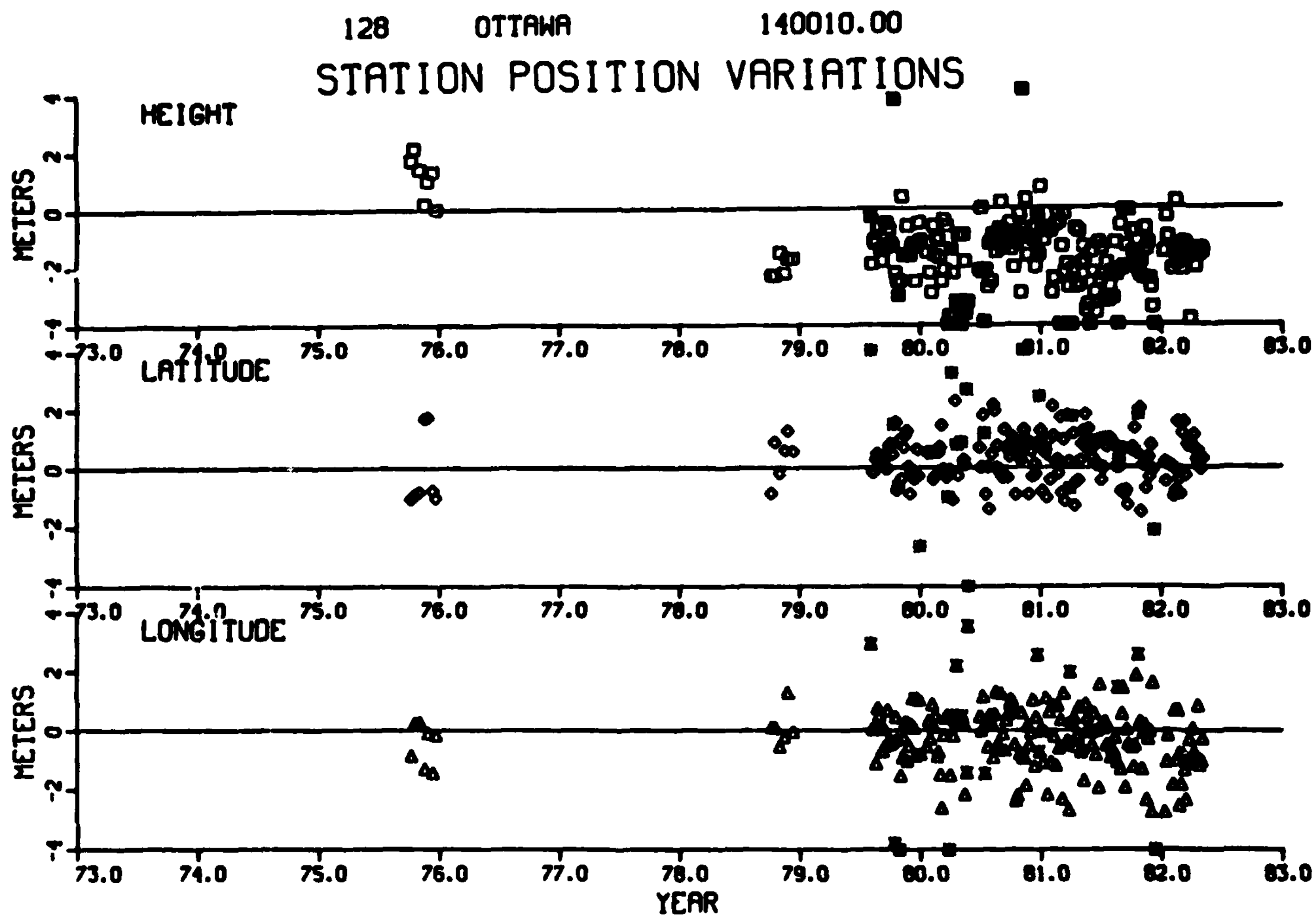
82.0
83.0
YEAR

FIGURE A-16



128 OTTAWA 140010.00
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LONGITUDE
METERS
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80.0
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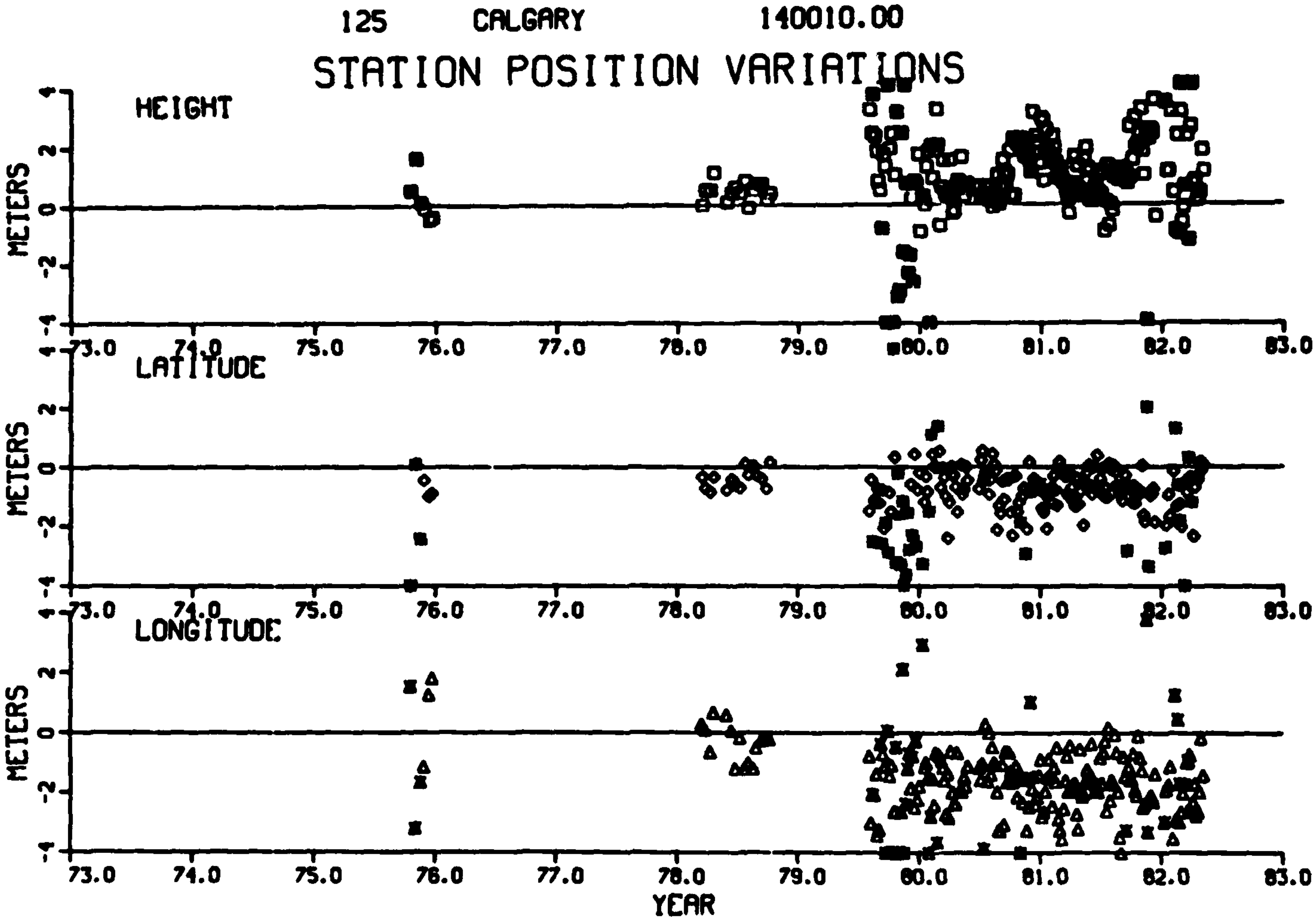
82.0
83.0
YEAR

FIGURE A-17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LATITUDE
LONGITUDE
METERS
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-2
-4
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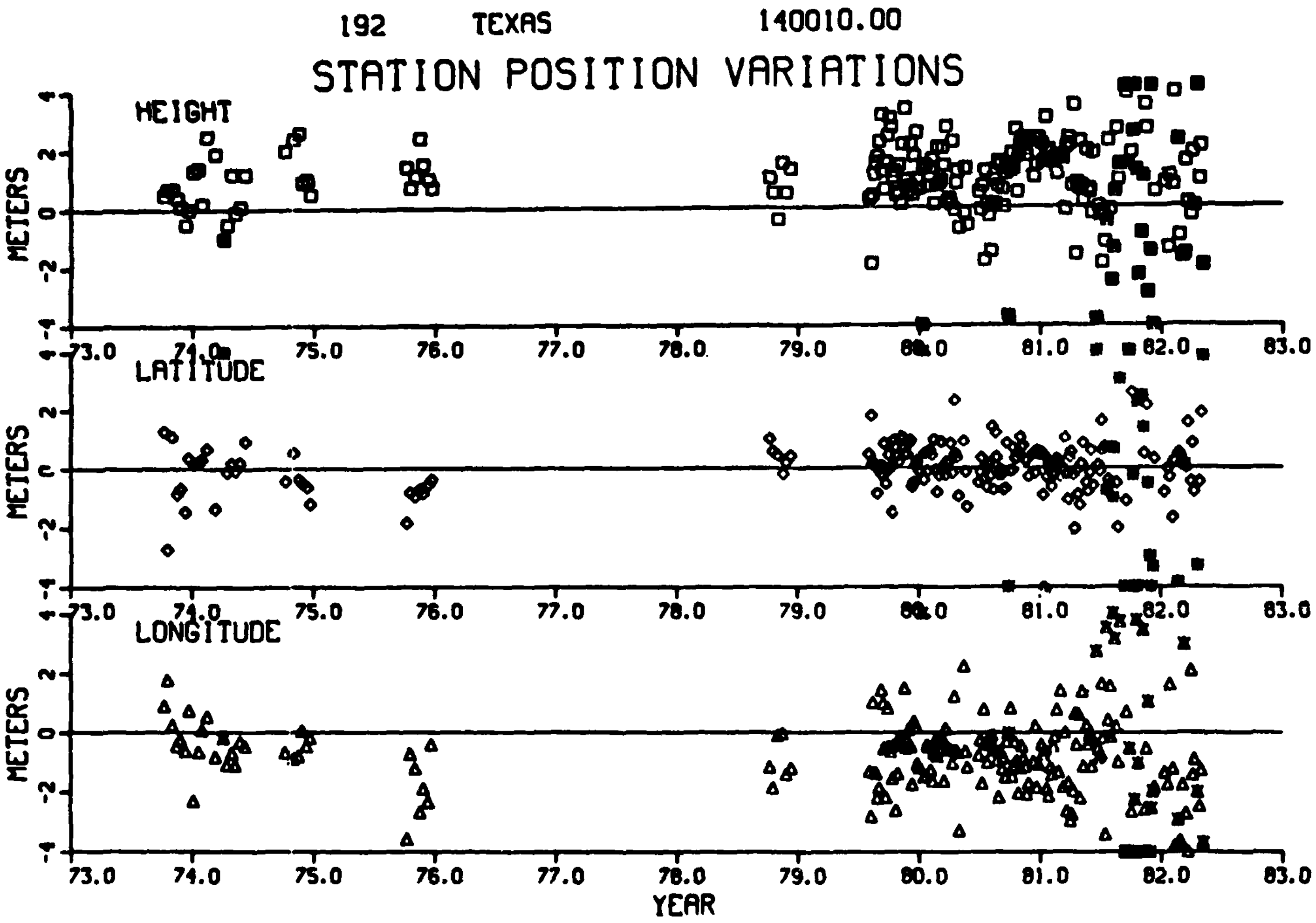
82.0
83.0
YEAR

FIGURE A-18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HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
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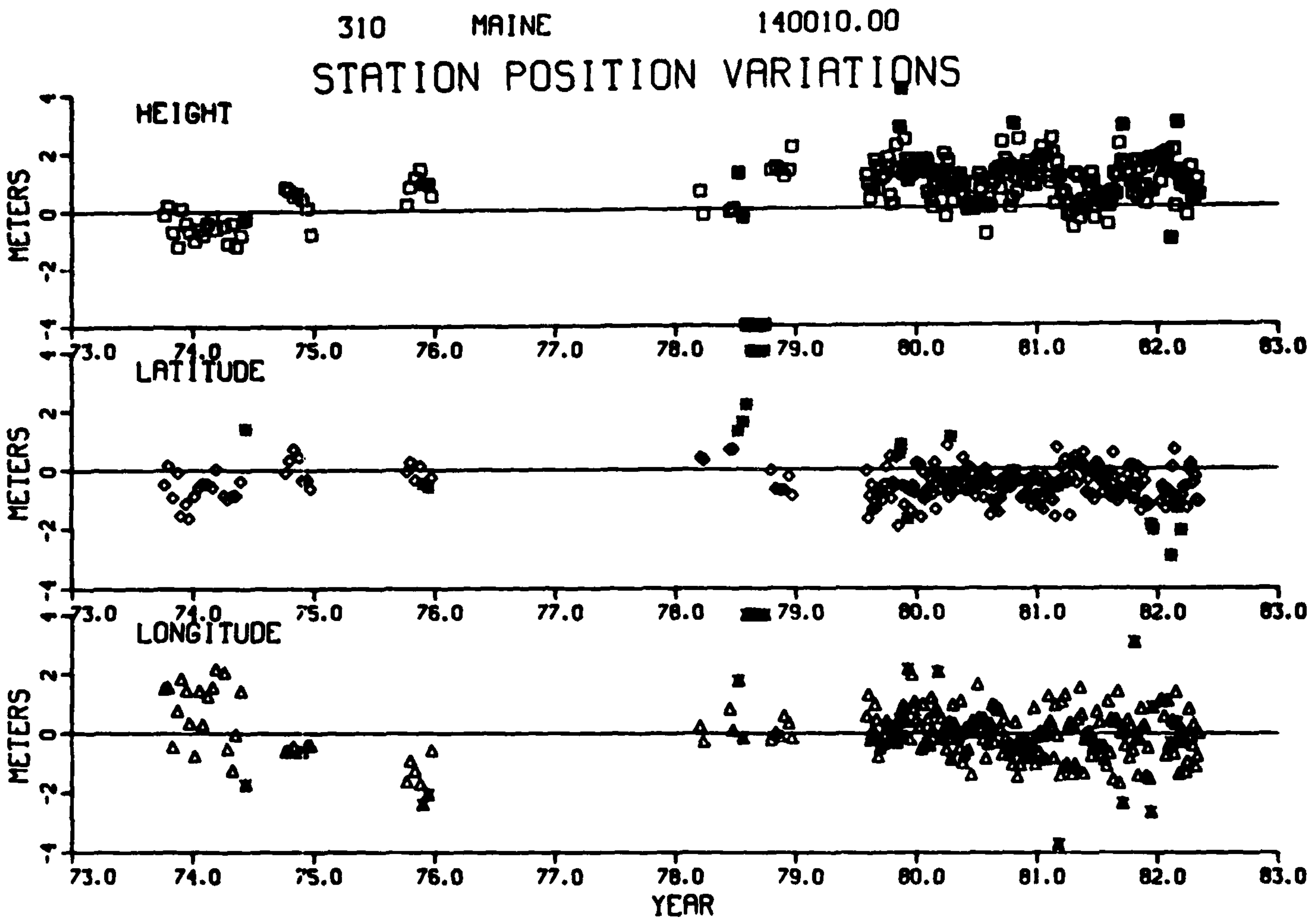
82.0
83.0

FIGURE A-19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HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
YEAR
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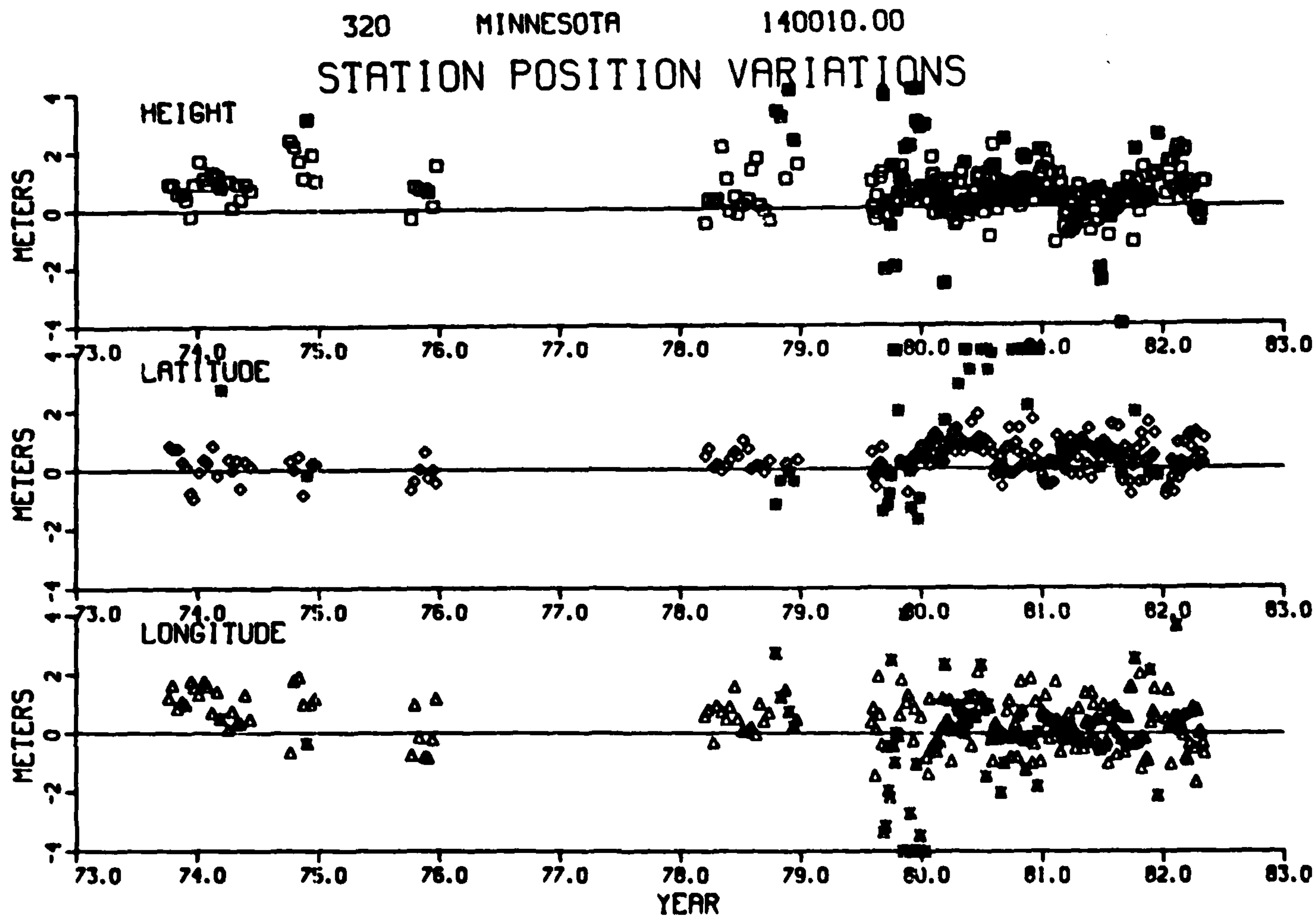
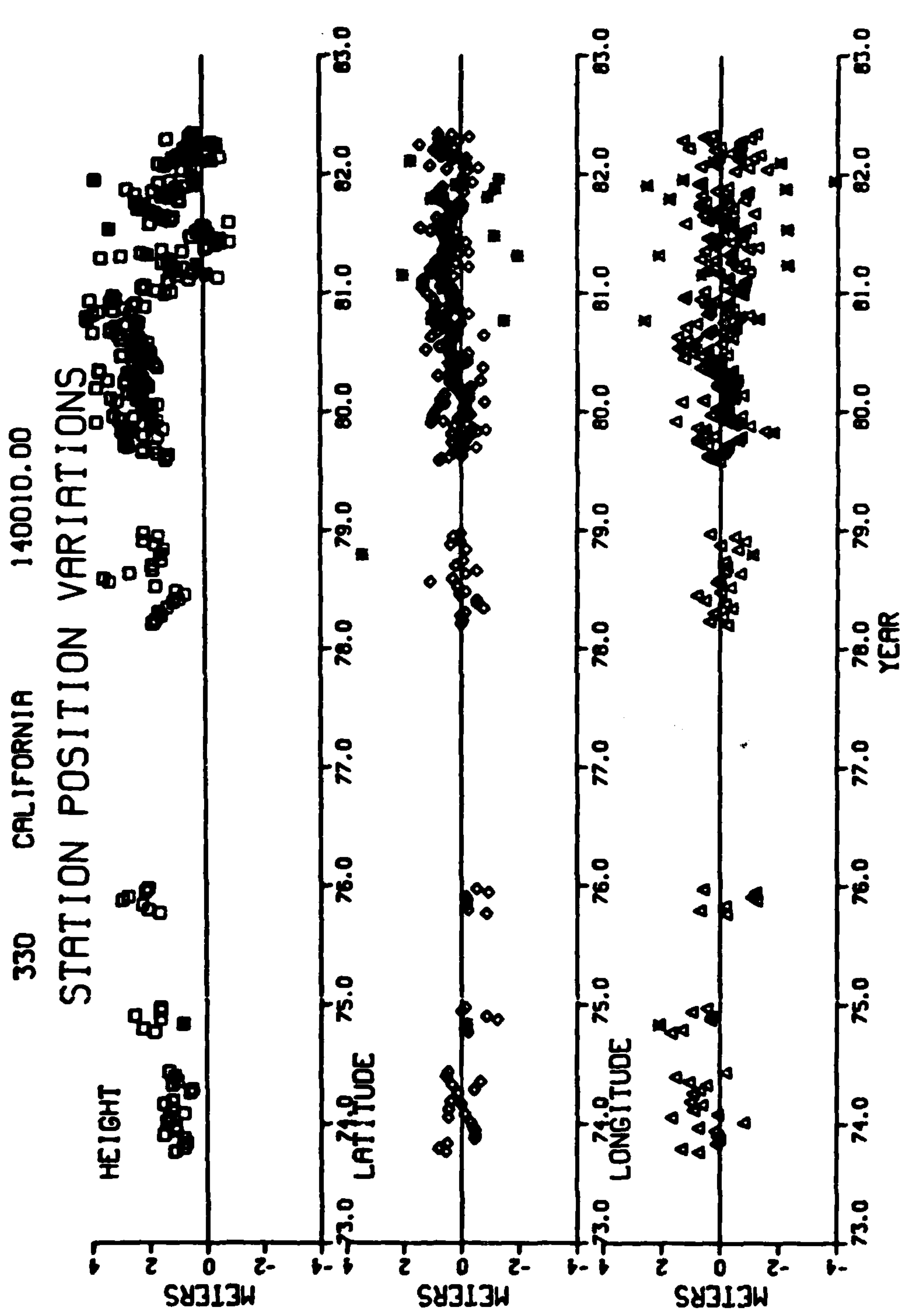
82.0
83.0

FIGURE A-20



320
MINNESOTA
140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
4
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-21



330 CALIFORNIA 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
YEAR
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74.0
75.0
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77.0
78.0
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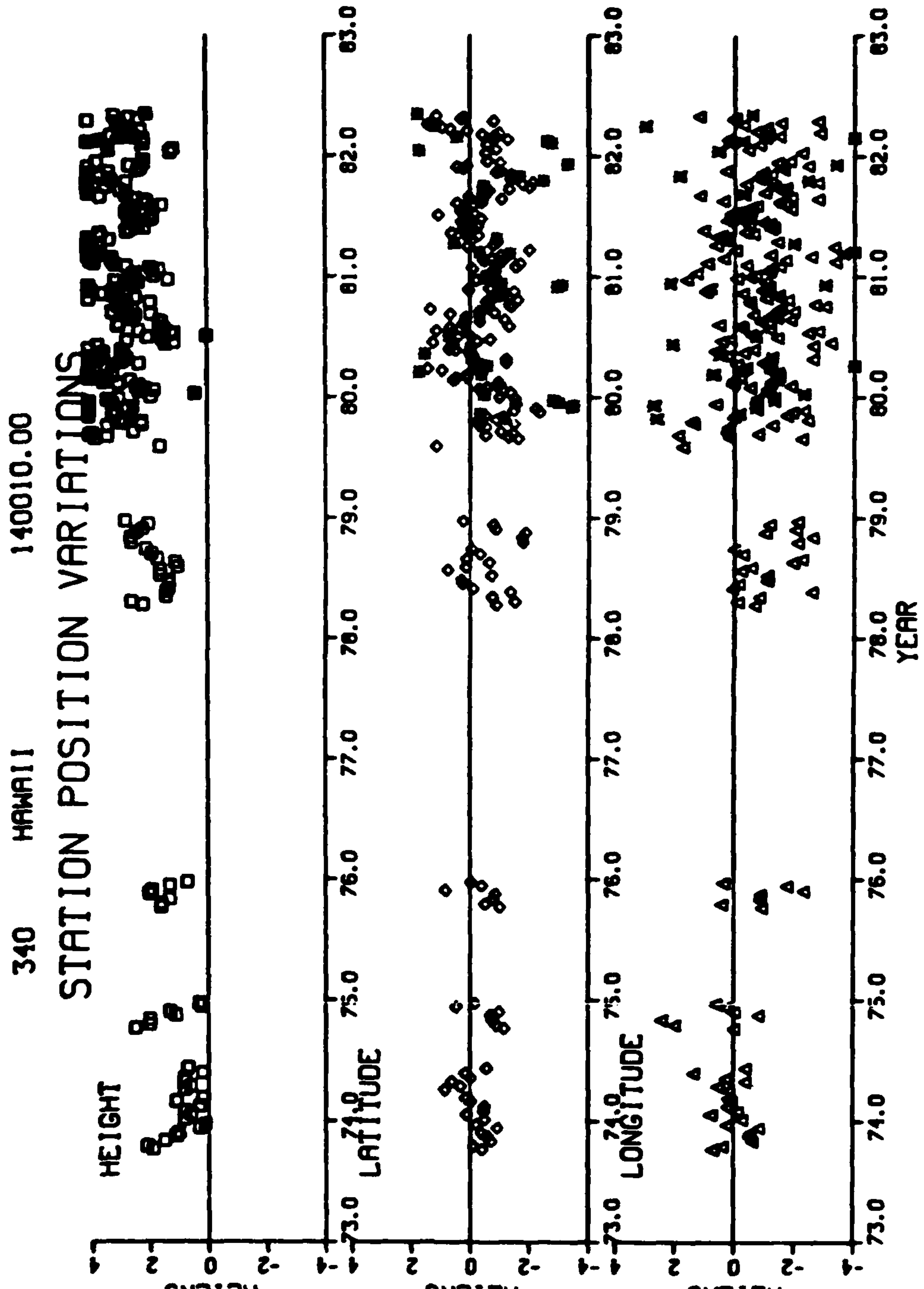
81.0
82.0
83.0

FIGURE A-22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STATION POSITION VARIATIONS
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LATITUDE
LONGITUDE
METERS
4
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0
-2
-4
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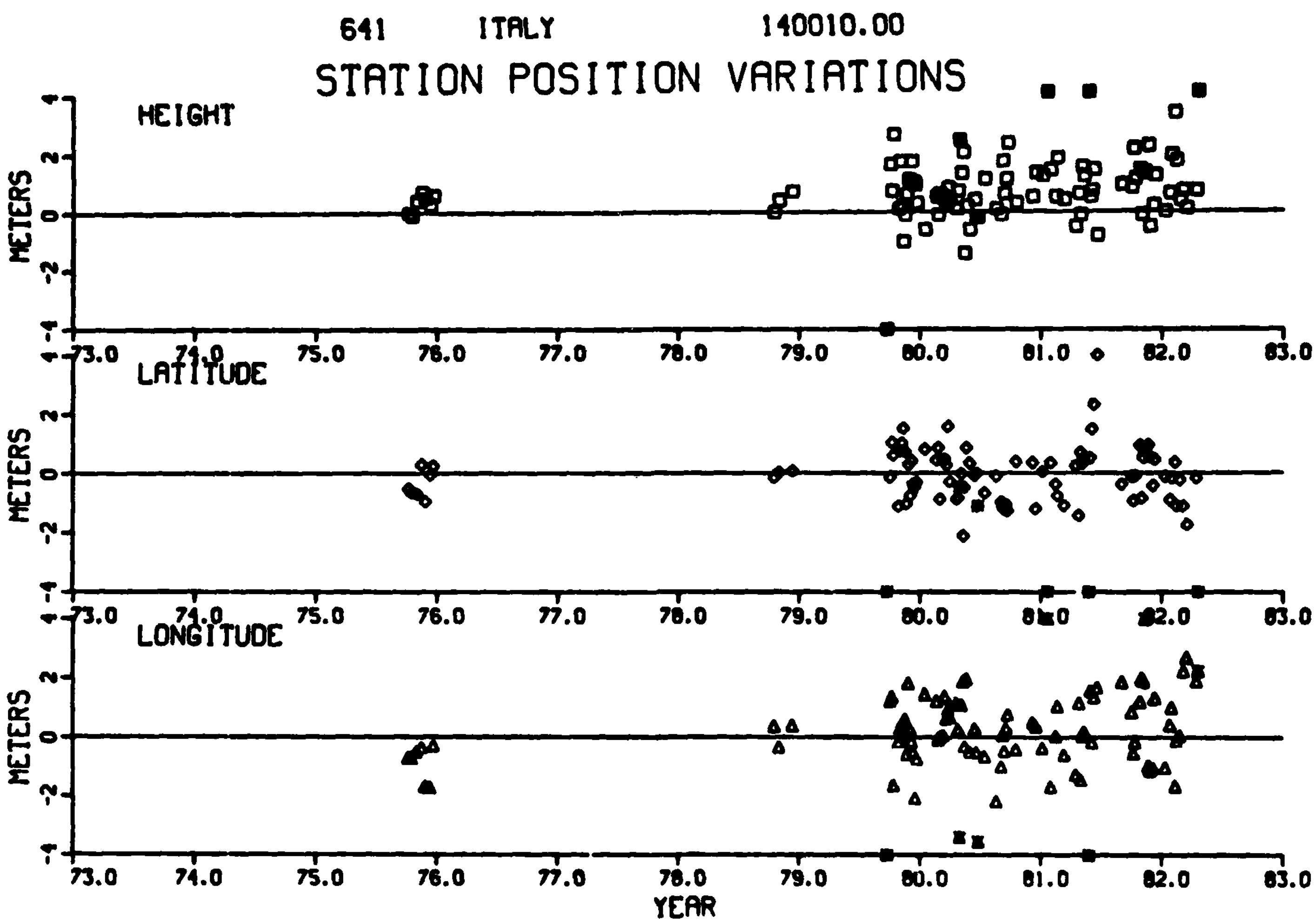
80.0
81.0
82.0
83.0
YEAR

FIGURE A-23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LATITUDE
LONGITUDE
METERS
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-2
-4
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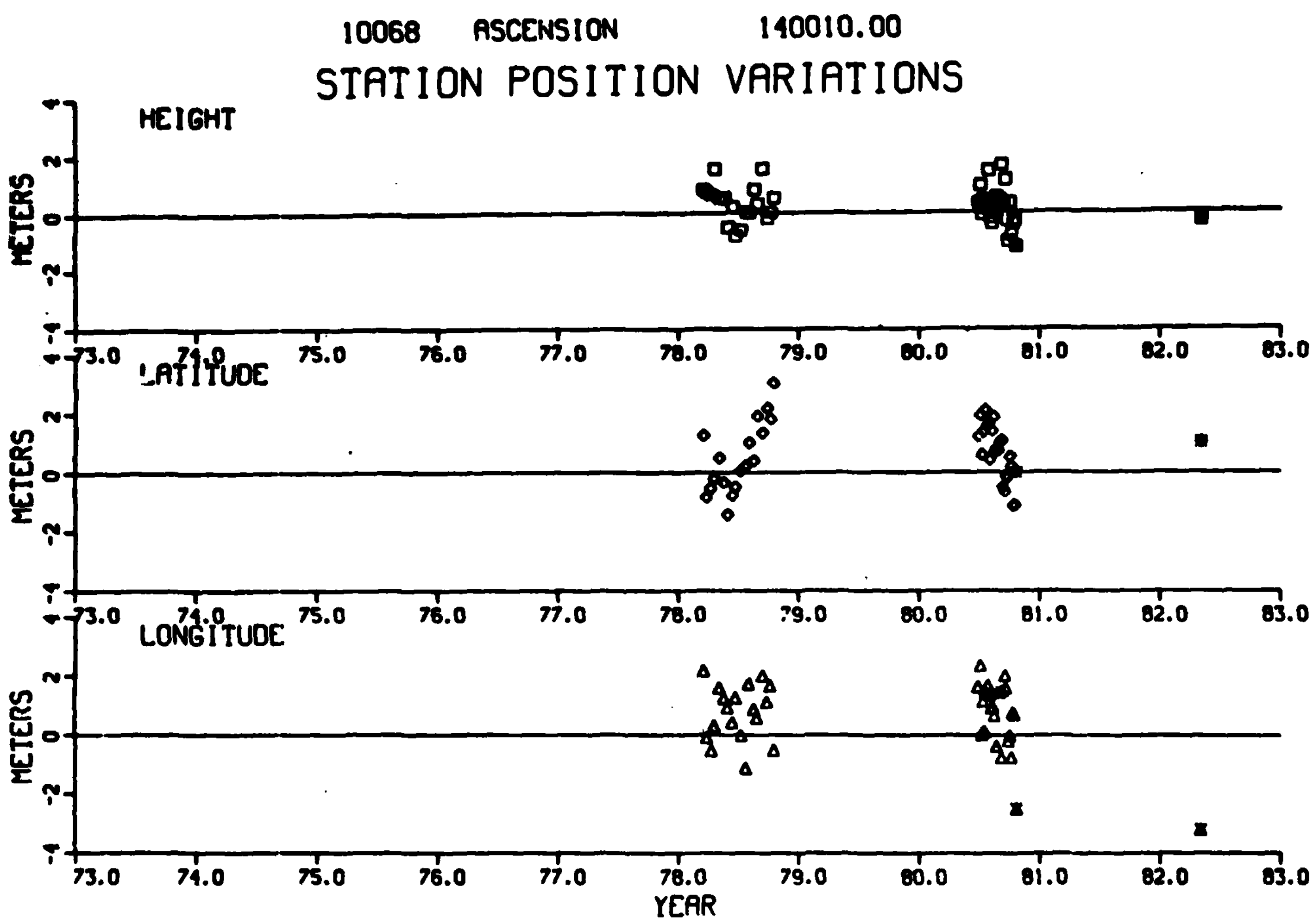
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-24


10068 ASCENSION 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
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-2
-4
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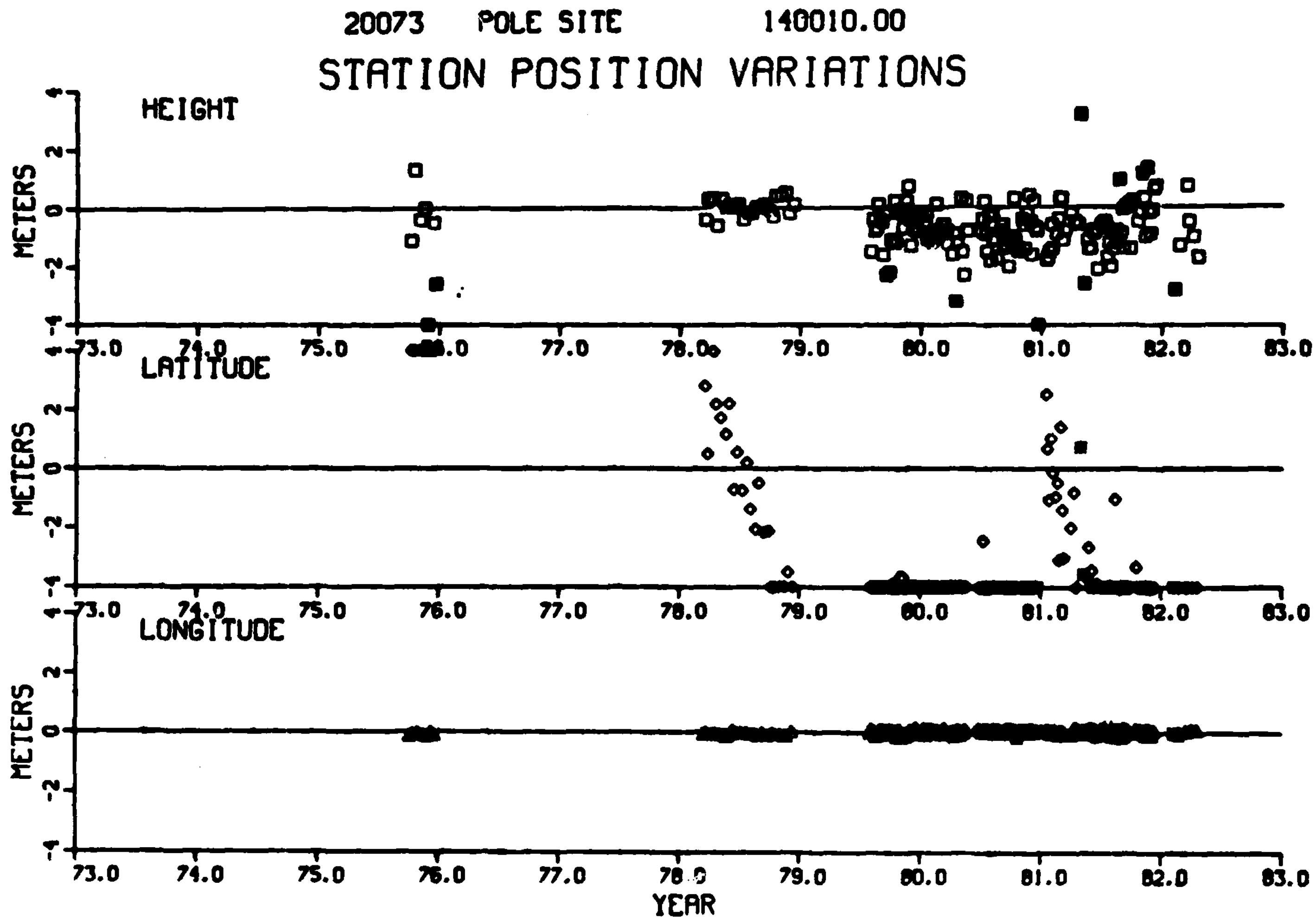
80.0
81.0
82.0
83.0
YEAR

FIGURE A-25


20073 POLE SITE 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
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76.0
77.0
78.0
79.0
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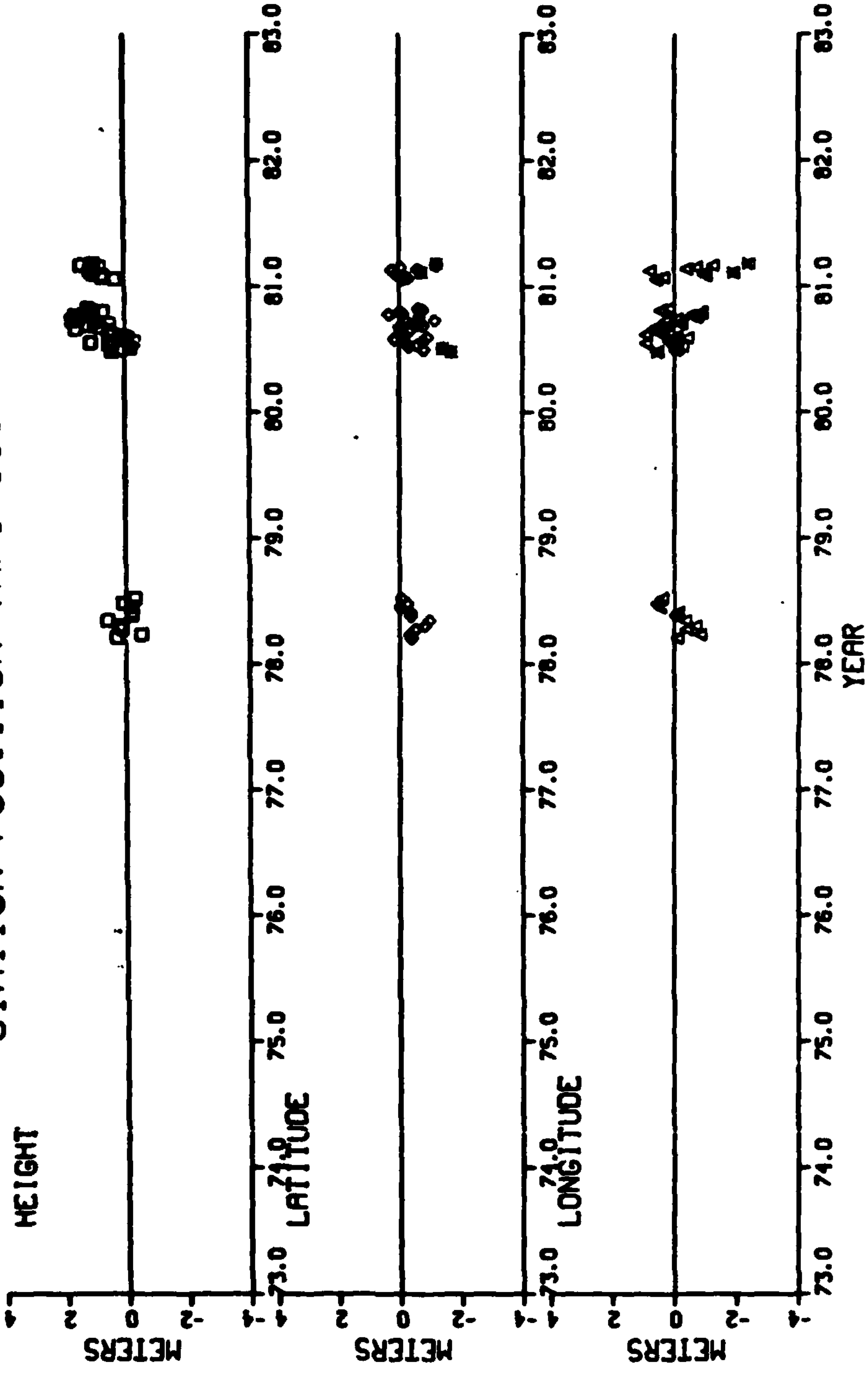
81.0
82.0
83.0

FIGURE A-26

20284 CATANIA 140010.00

STATION POSITION VARIATIONS



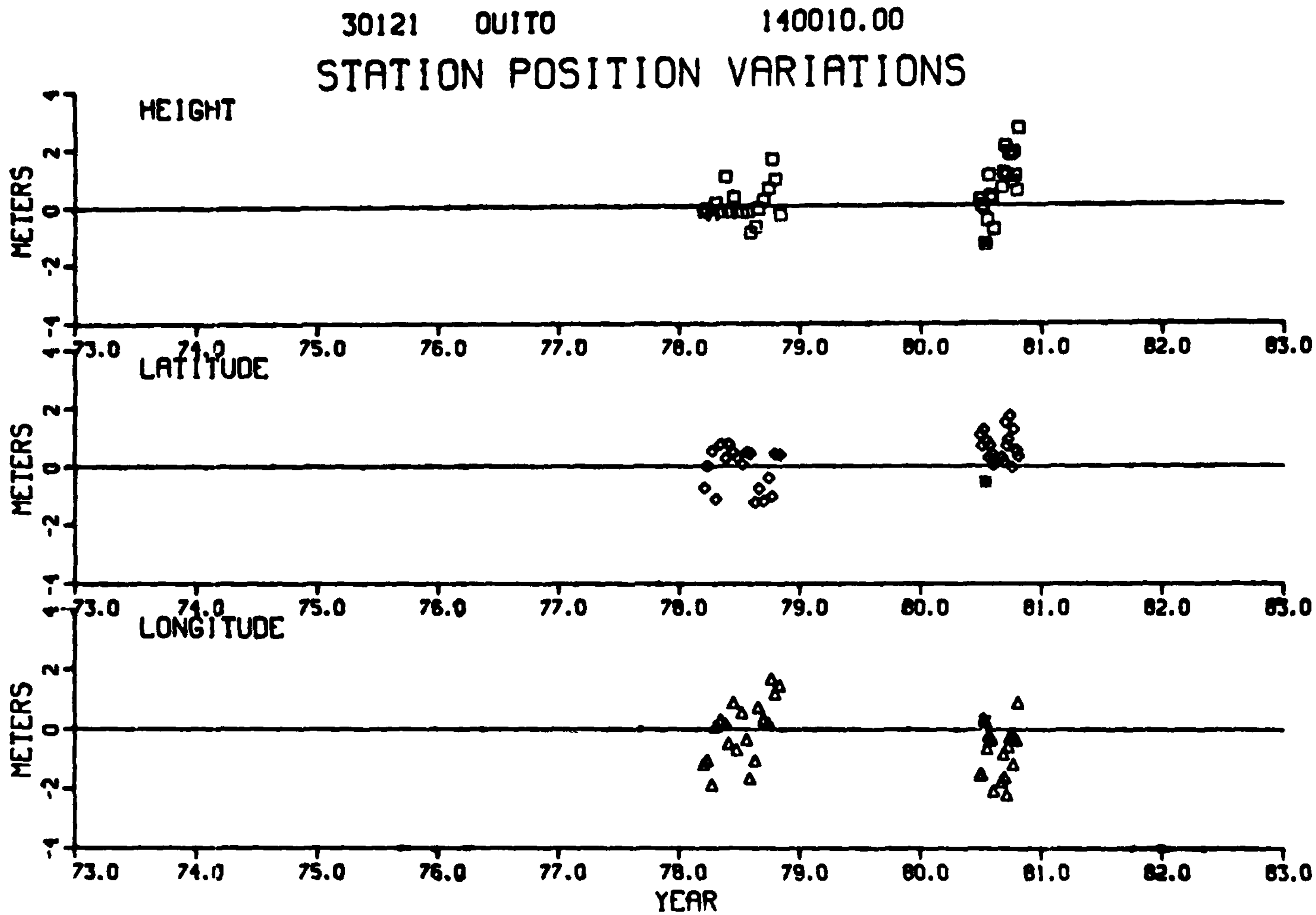
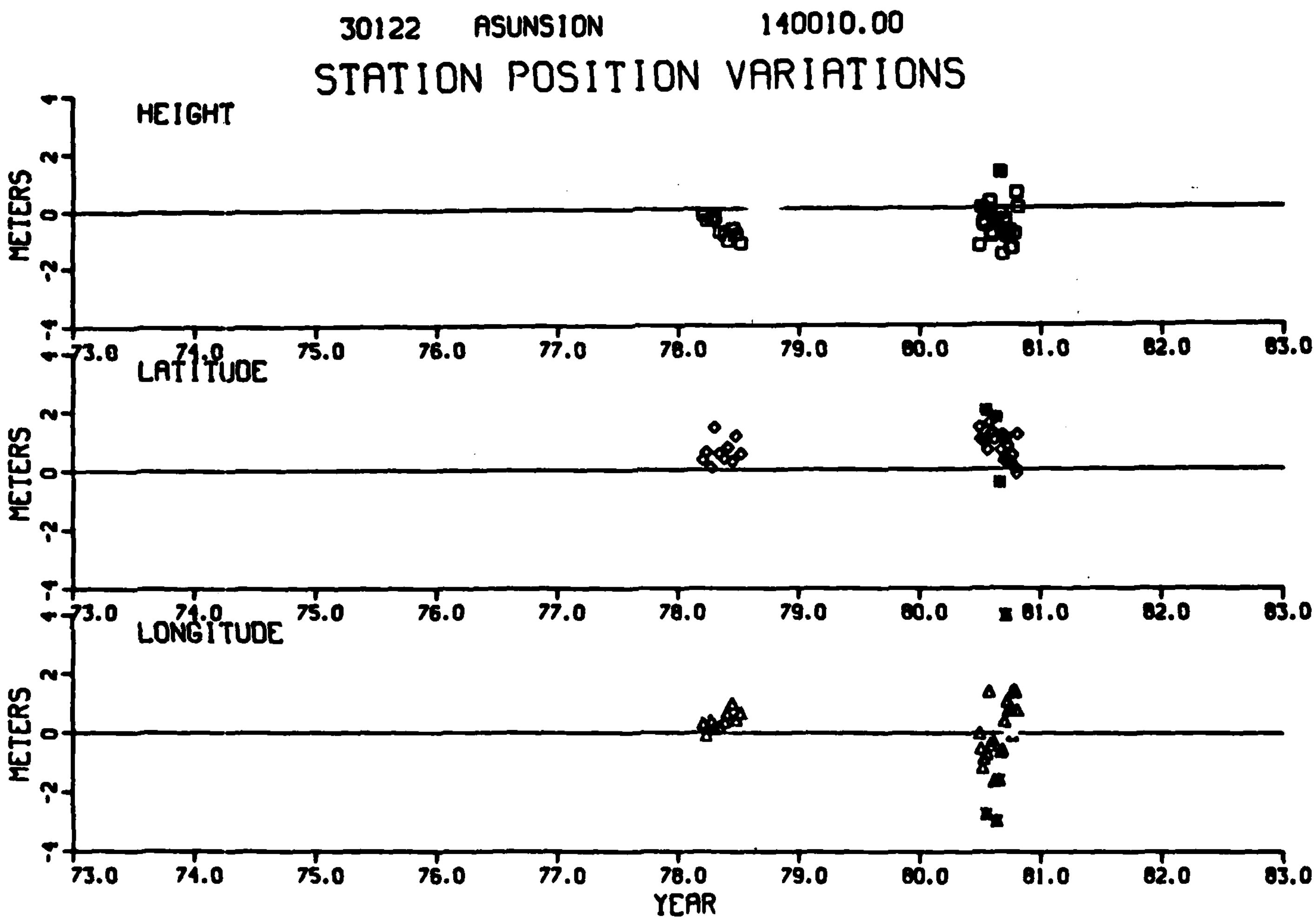

30121 QUITO 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
4
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-28


30122 ASUNSION 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
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-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-29

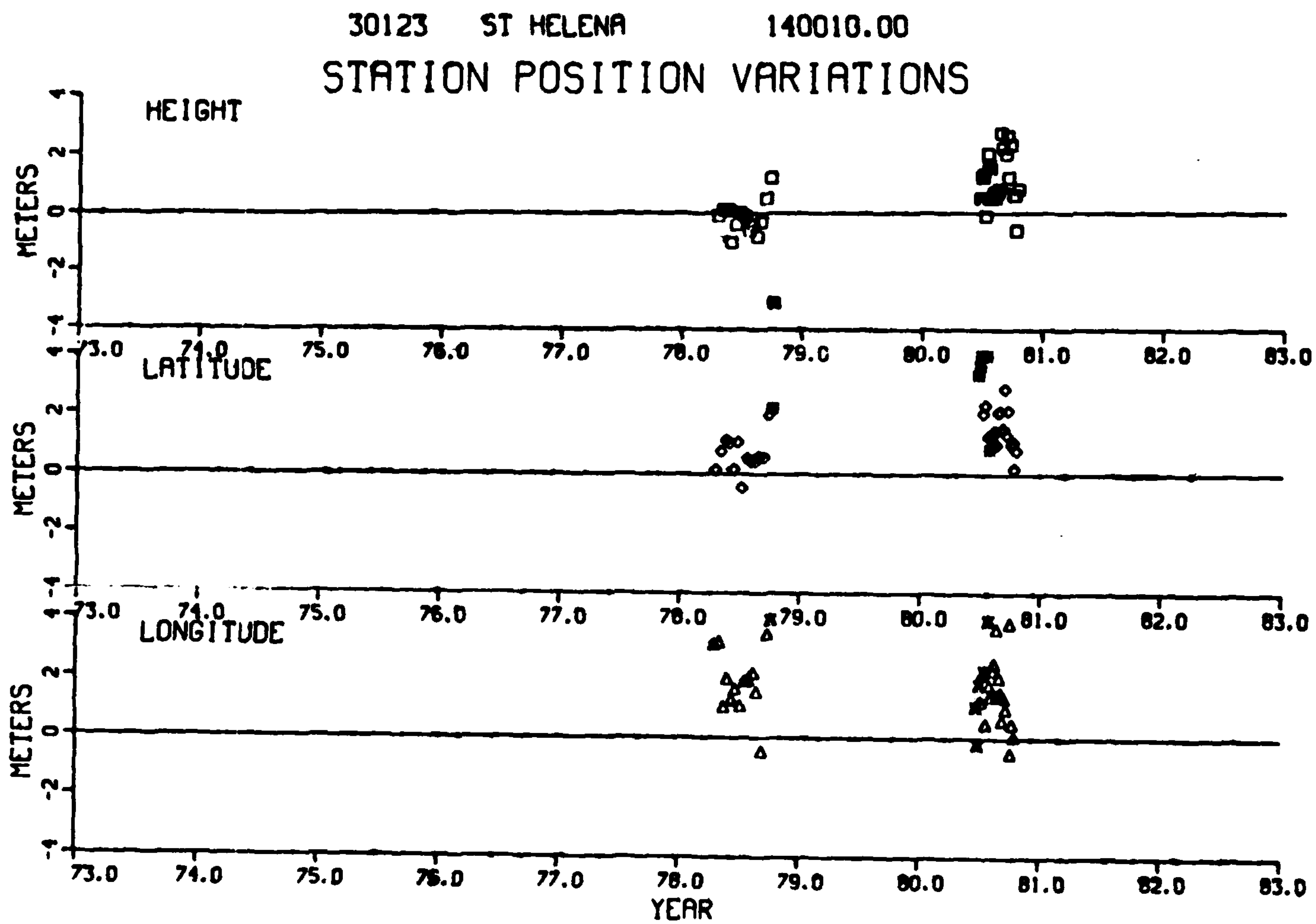
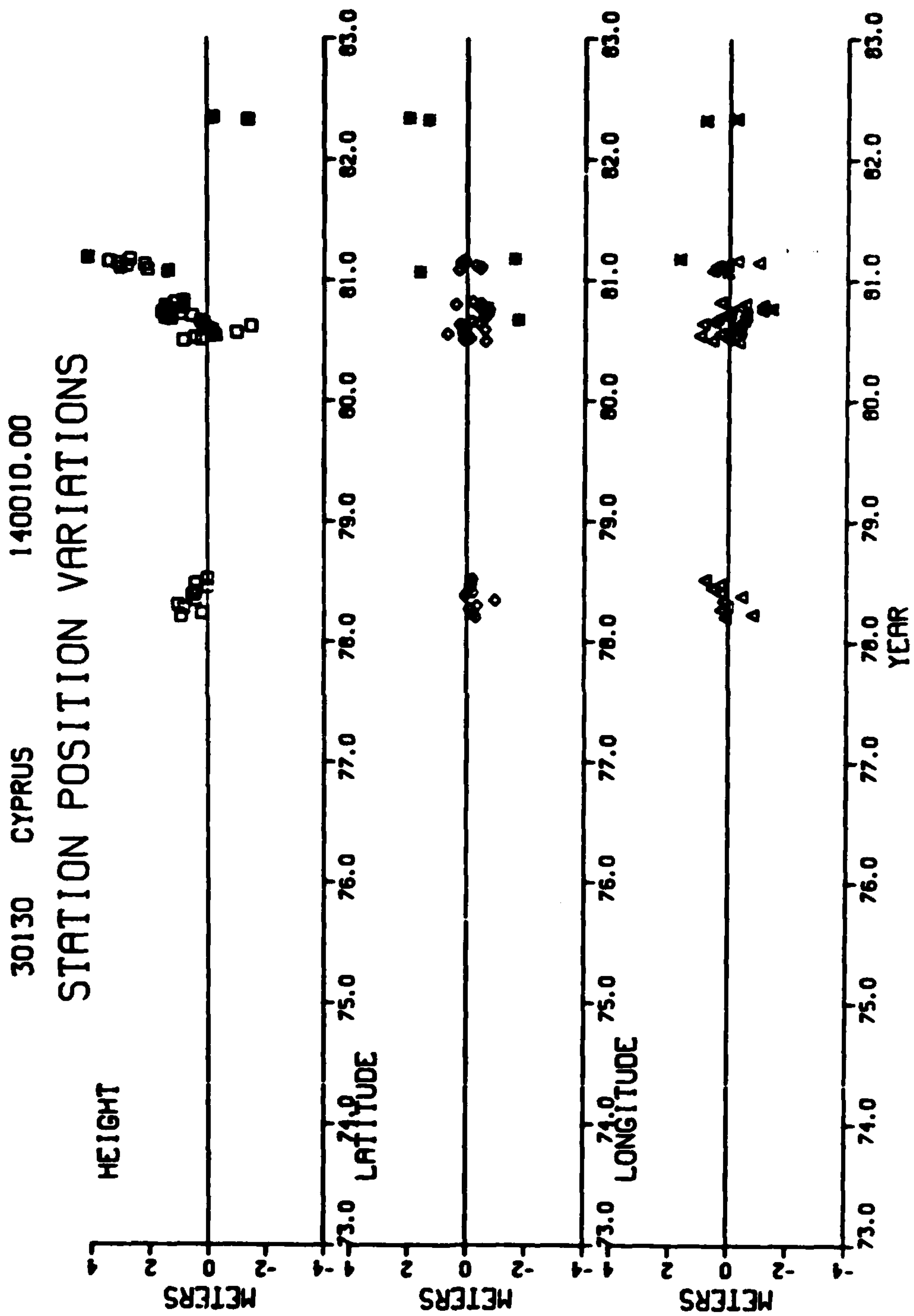

30123 ST HELENA 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR

FIGURE A-30



30130 CYPRUS 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
4
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

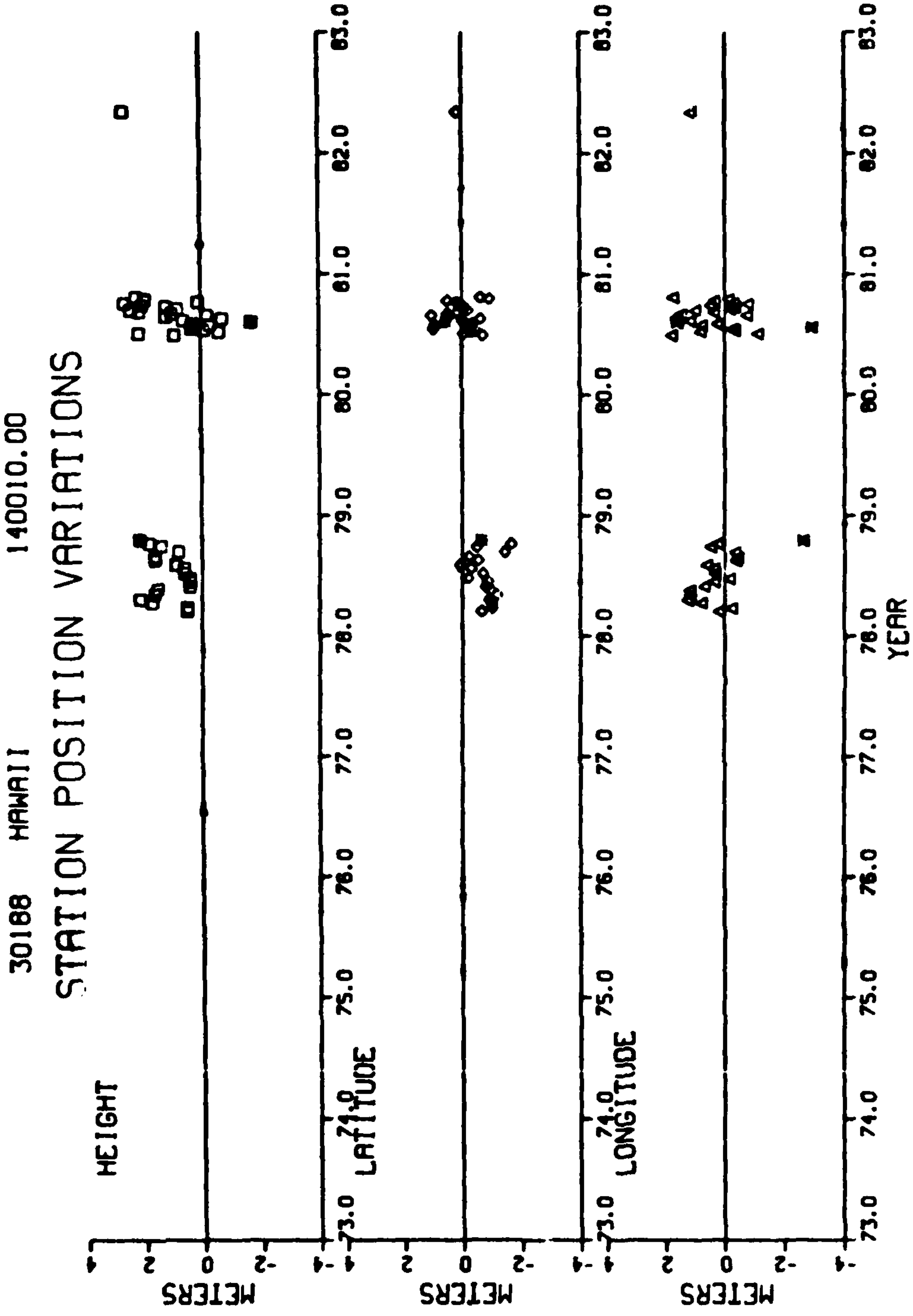

30188 HAWAII 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
4
2
0
-2
-4

FIGURE A-32

30280 SANTIAGO 140010.00

STATION POSITION VARIATIONS

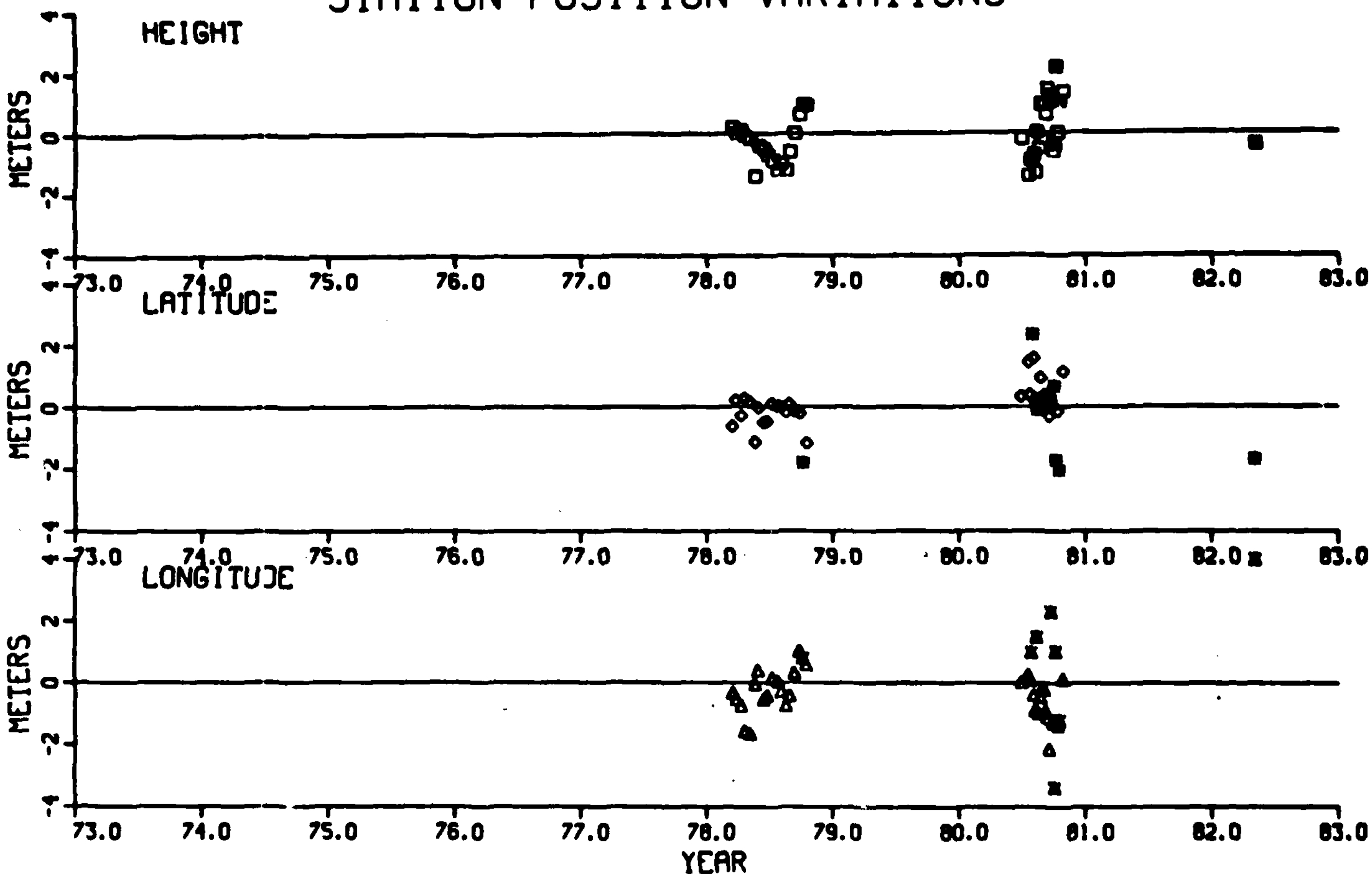


FIGURE A-33

30682 VIRGINIA 140010.00

STATION POSITION VARIATIONS

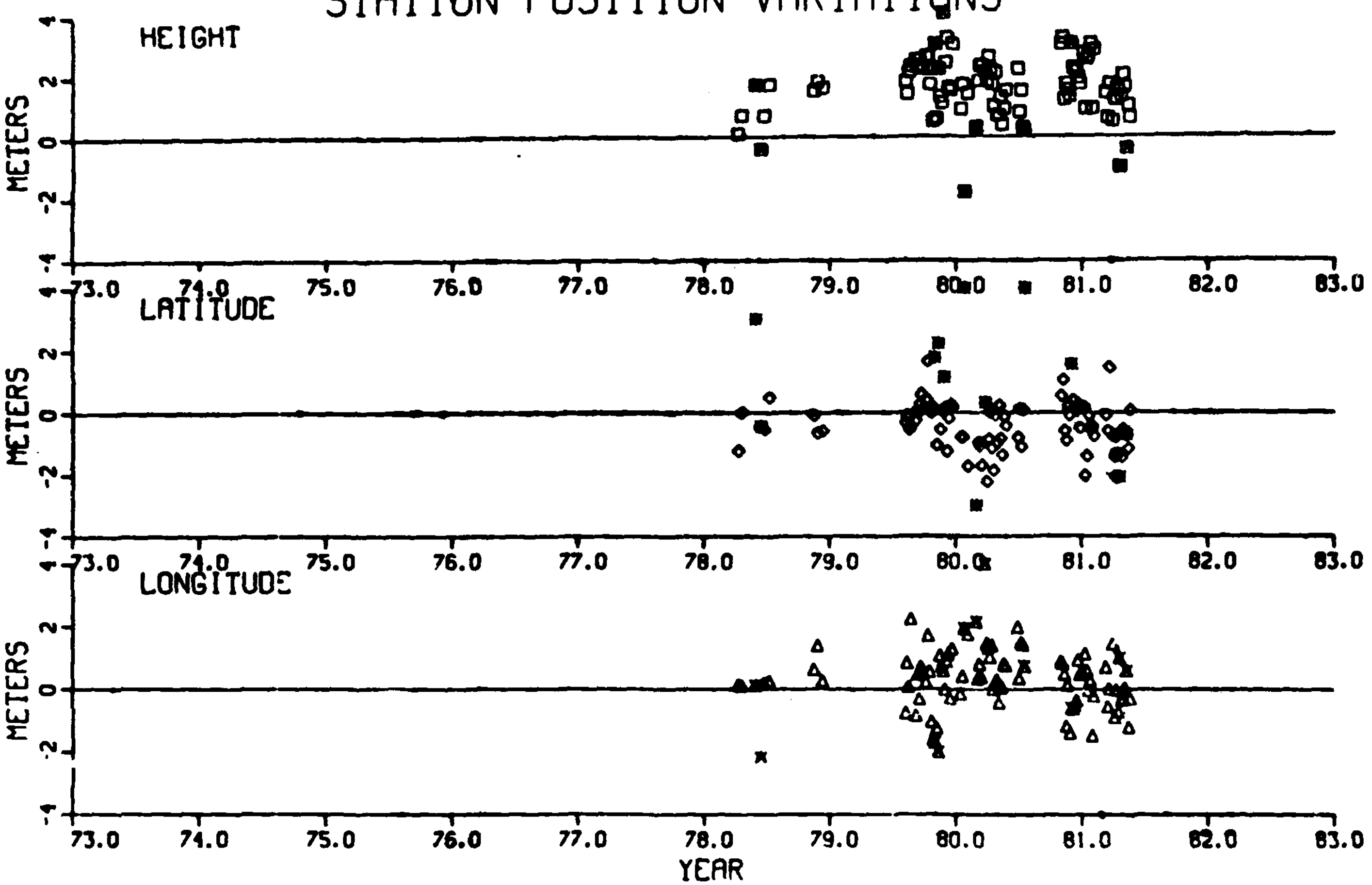
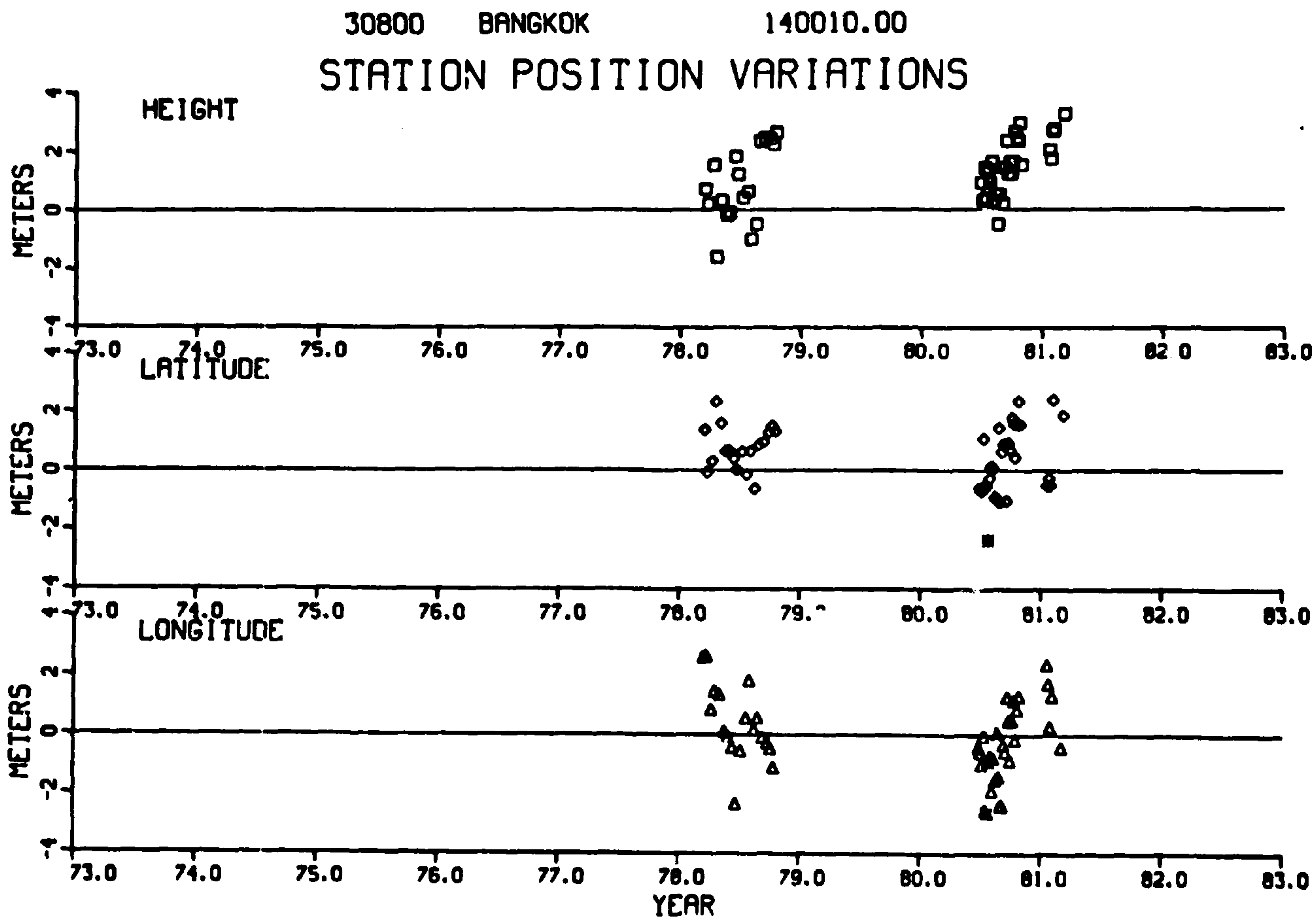


FIGURE A-34

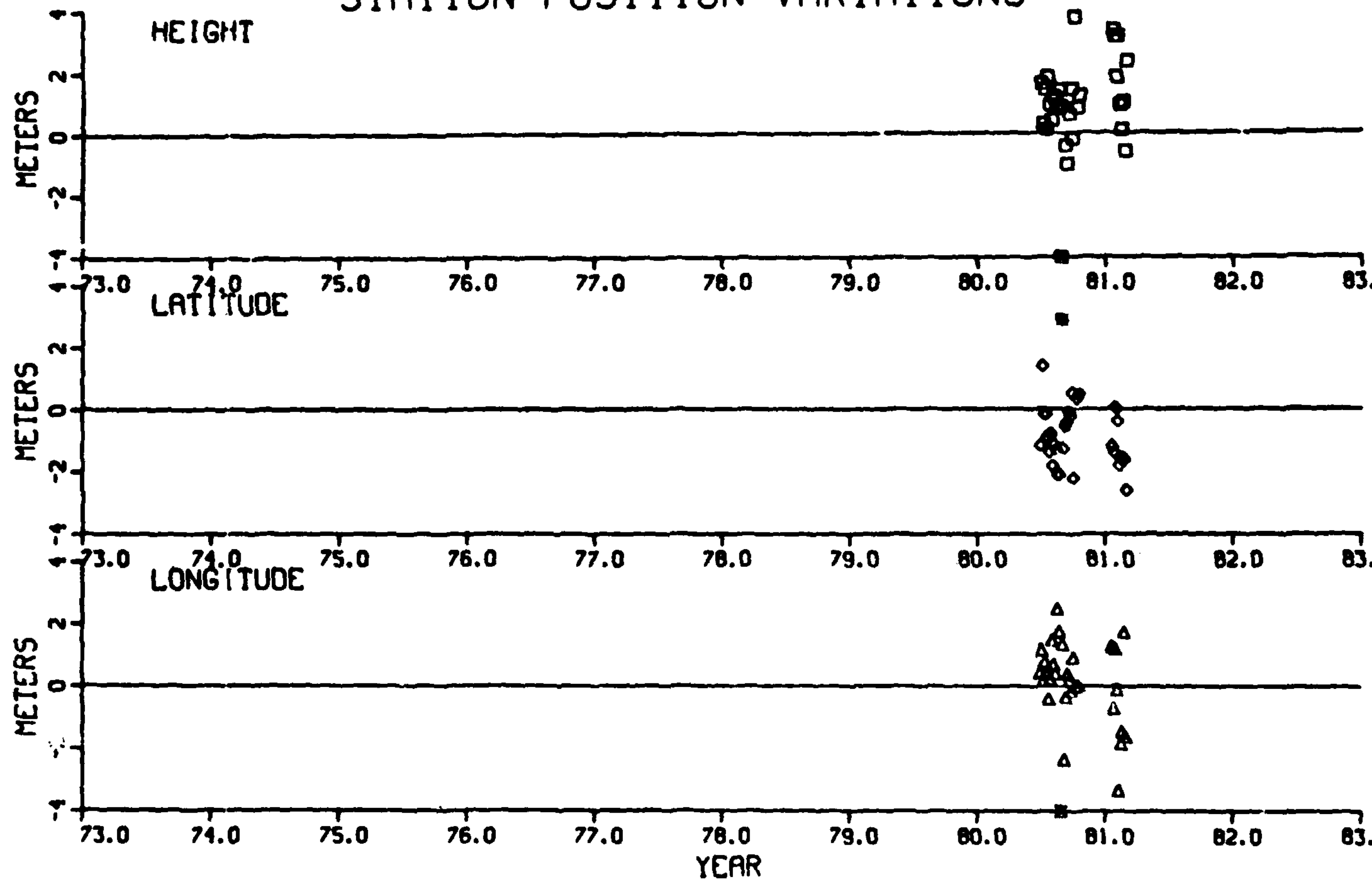


30800 BANGKOK 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
YEAR
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0

FIGURE A-35

31039 CAMBR BAY 60010.00

STATION POSITION VARIATIONS



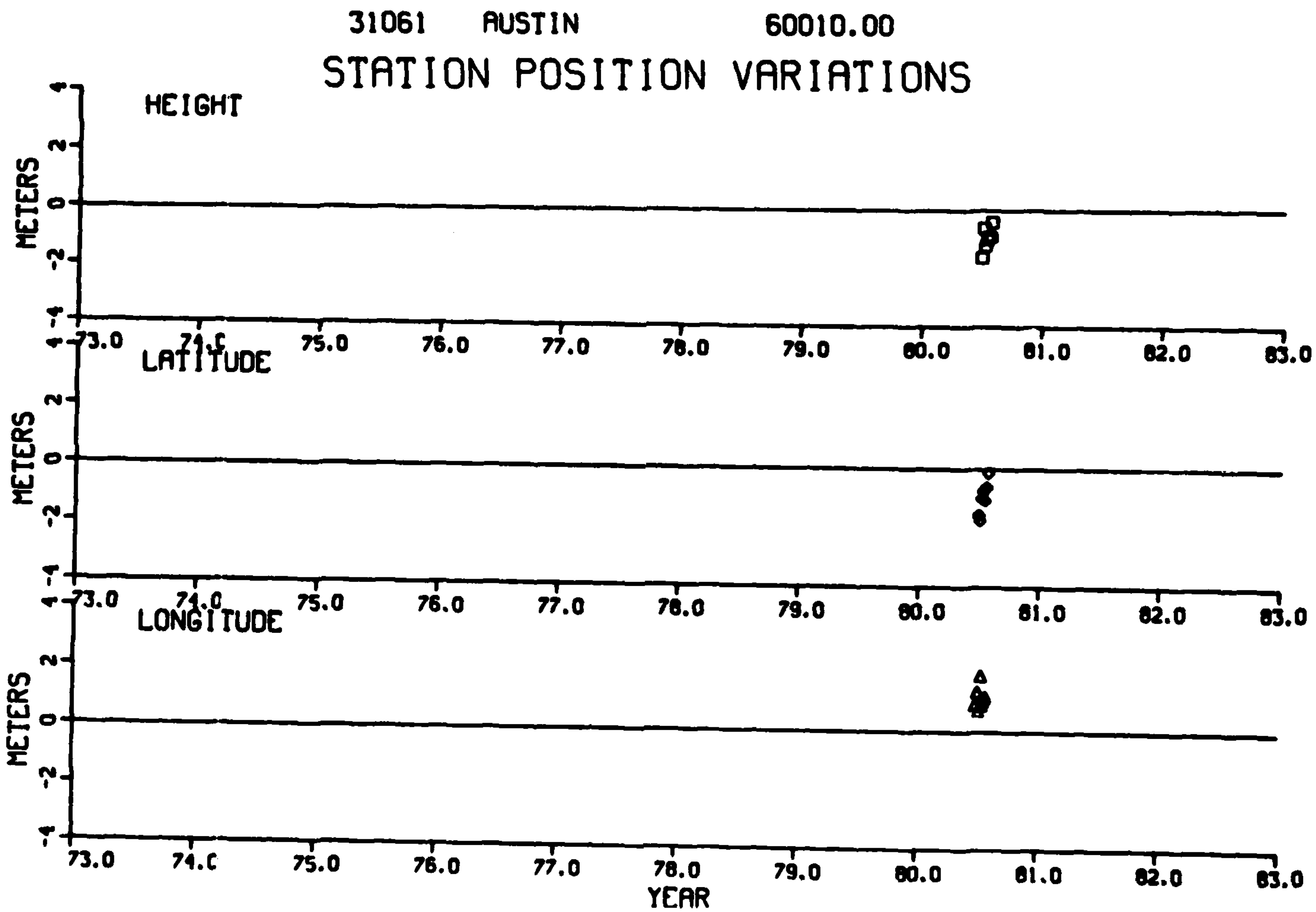

31061 AUSTIN 60010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
4
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-37

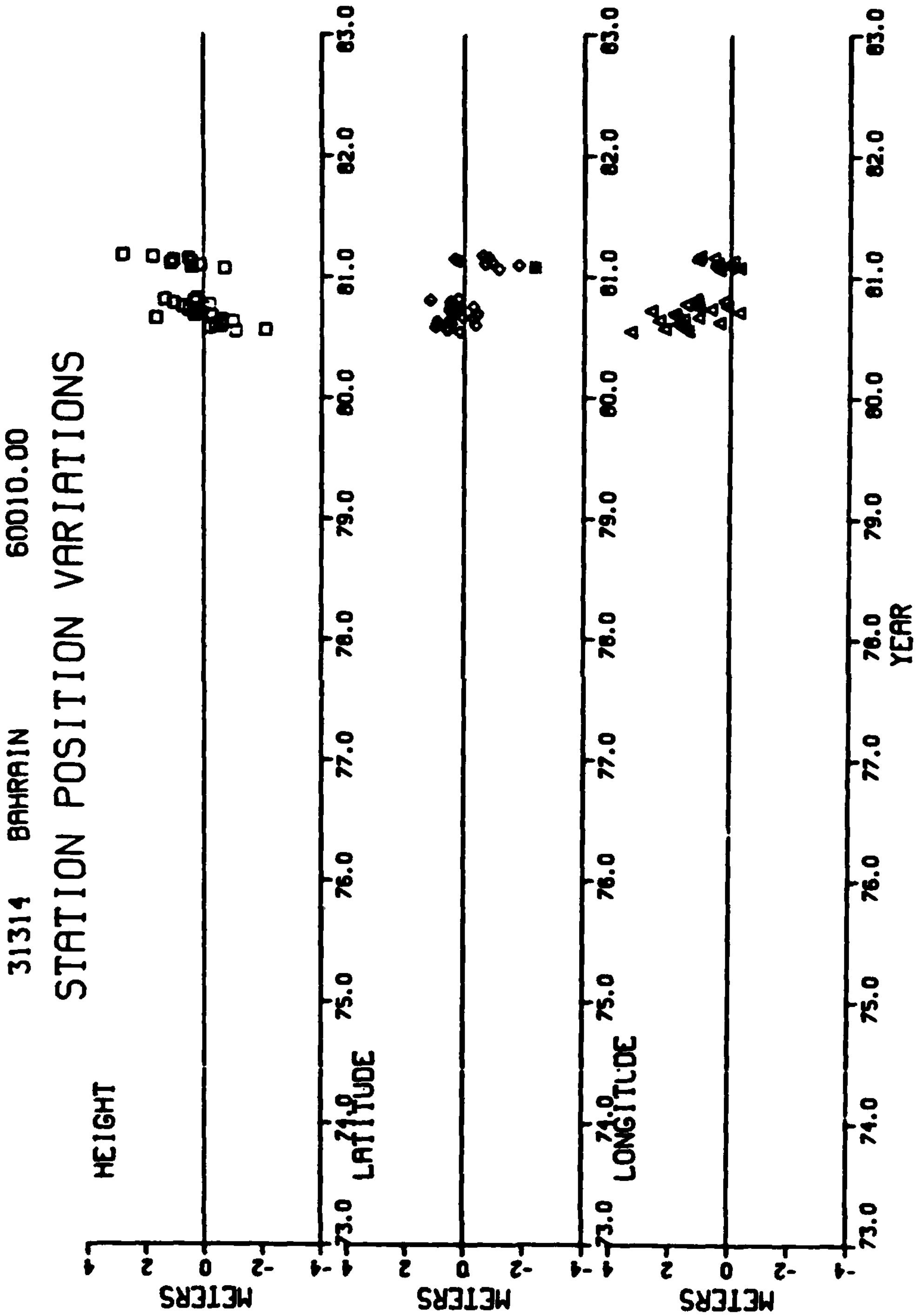

31314 BAHRAIN 60010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
4
2
0
-2
-4
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0
YEAR

FIGURE A-38

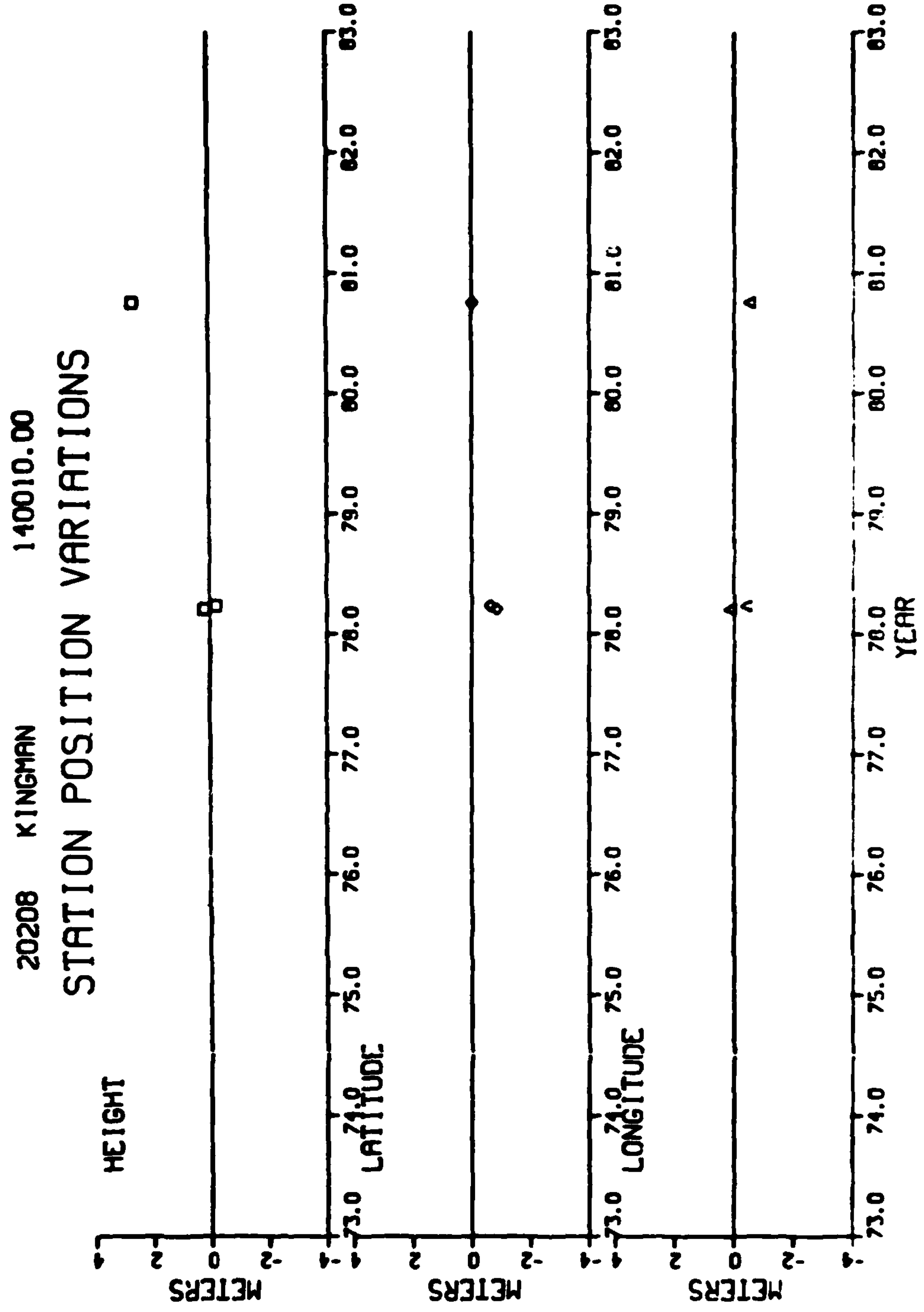
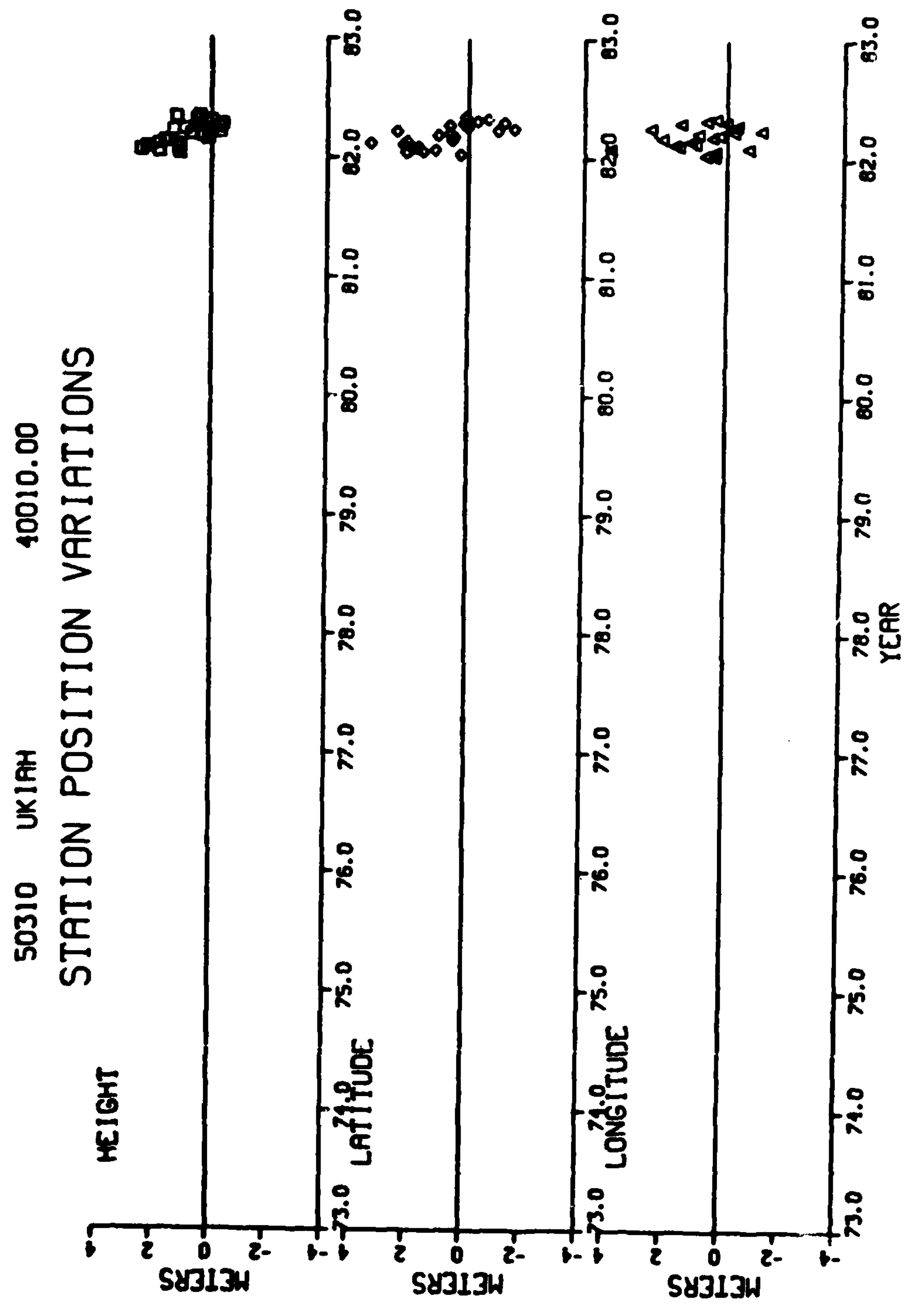

20208 KINGMAN 140010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
YEAR
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
81.0
82.0
83.0

FIGURE A-39



50310 UKIAH 40010.00
STATION POSITION VARIATIONS
HEIGHT
LATITUDE
LONGITUDE
METERS
METERS
METERS
4 2 0 -2 -4
73.0 74.0 75.0 76.0 77.0 78.0 79.0 80.0 81.0 82.0 83.0
YEAR

FIGURE A-40

APPENDIX B

SOLUTIONS FOR MEAN COORDINATES

DOPPLER NAVSAT SOLUTION NSWC 820907

LONGITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8	.32	-.19	-.06	.61	.11	.59	.72	.50	.37	-.31	.33	.76	.54	-.10	-.30
2	19	-.14	.40	.11	.63	.14	.63	.88	.52	.64	-.29	.57	1.02	.68	-.14	-.02
3	21	.00	.12	.37	.70	.14	.61	.79	.48	.45	-.36	.38	.80	.46	-.15	-.16
4	23	.47	.52	.59	.23	-.53	-.09	.09	-.20	-.44	-1.02	-.35	.09	-.16	-.86	-1.20
5	24	-.11	-.28	-.12	-.60	.32	.42	.59	.37	-.12	-.53	.25	.71	.41	-.34	-.73
6	112	.54	.47	.52	-.03	.61	.28	.24	-.09	-.22	-.94	-.17	.25	-.03	-.76	-.91
7	113	.76	.84	.78	.22	.87	.34	.41	-.29	-.37	-1.14	-.41	.03	-.28	-.93	-.92
8	114	.48	.40	.38	-.14	.57	-.09	-.36	.08	-.20	-.77	-.06	.27	.10	-.67	-.76
9	118	1.03	.97	.74	.18	.93	.35	-.02	.33	.00	-.72	.05	.56	.20	-.34	-.34
10	192	-.32	-.42	-.44	-.98	-.38	-.95	-1.22	-.75	-1.20	.81	.79	1.22	.03	.16	.19
11	310	.29	.47	.32	-.30	.41	-.14	-.47	-.04	-.39	.82	.01	.46	.13	-.54	-.61
12	320	.64	.65	.66	.10	.84	.19	-.11	.18	-.16	1.18	.40	.51	-.36	-1.05	-1.24
13	330	.47	.53	.34	-.15	.56	-.05	-.39	.07	-.37	.80	.09	-.34	.89	-.74	-.85
14	340	-.29	-.44	-.38	-.91	-.28	-.90	-1.16	-.82	-1.20	.07	-.67	-1.11	-.81	.60	-.36
15	20	-.49	-.54	-.46	-1.14	-.25	-1.00	-1.12	-.80	-1.03	.53	-.60	-1.06	-.73	-.14	.63
16	22	.79	1.14	.71	.26	1.26	.26	-.00	.35	.18	1.66	.61	.24	.38	1.42	1.35
17	105	.23	.27	.15	-.36	.23	-.35	-.62	-.26	-.59	.59	-.18	-.53	-.27	.54	.52
18	195	-78.01	.59	-84.49	-101.31	-122.73	-48.01	-75.17	-70.69	-56.74	-63.63	-78.87	-93.00	-78.29	-67.93	-109.03
19	196	5.04	3.40	4.77	-5.00	8.10	5.41	3.24	-.98	4.64	5.42	6.57	-1.92	1.22	.29	-.17
20	27	.06	.12	.11	-.46	.27	-.38	-.71	-.28	-.63	.53	-.15	-.44	-.29	.43	.37
21	128	.19	.38	.24	-.27	.43	-.26	-.58	-.16	-.40	.64	-.07	-.49	-.18	.60	.48
22	641	.71	.40	.50	.10	.69	.02	-.18	.30	-.47	.90	.35	-.05	.18	1.20	1.14
23	125	-.87	-.69	-.94	-1.38	-.76	-1.34	-1.63	-1.30	-1.48	-.39	-1.24	-1.45	-1.17	-.38	-.27
24	10068	1.92	1.24	1.33	1.21	2.07	.53	.07	.60	1.39	1.78	.72	.64	.62	1.94	0.00
25	30121	.64	.30	-.01	.26	1.16	-.57	-.46	-.17	-.59	.84	-.63	-.95	-.88	.67	0.00
26	30122	.76	1.38	.56	.29	-2.17	-.03	-5.41	-4.11	-4.62	-3.00	-.00	-.15	-.18	1.28	0.00
27	30130	2.47	4.09	.28	.14	2.21	-.06	-.29	.05	-1.96	1.21	-.17	-.41	-.12	1.12	0.00
28	30188	1.07	.67	.85	.74	1.43	.19	-.61	.14	-.63	1.19	.15	.29	.34	1.65	0.00
29	30280	6.20	.01	-.10	-.43	1.25	-.64	-.52	-.57	1.34	1.10	-.71	-.82	-.87	.58	0.00
30	30800	.02	-.41	.40	.23	.56	-.54	-1.04	-.84	-6.54	.44	-.57	-.16	-.31	1.01	0.00
31	20284	3.20	4.07	.24	-.02	3.46	-.17	.21	-.07	-.69	1.59	-.12	-.43	-.22	1.07	0.00
32	30939	0.00	0.00	.66	.31	0.00	.48	0.00	0.00	0.00	0.00	.44	1.26	1.80	2.39	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	1.51	1.37	1.93	-2.81	0.00
34	30123	6.78	9.47	2.15	2.16	7.43	1.39	3.20	2.77	-1.25	4.67	1.34	1.21	1.55	2.71	0.00
35	127	.05	-.68	-.18	-.52	.20	-.89	-1.20	-1.01	-2.94	.20	-1.01	-.78	-2.09	.55	0.00
36	107	1.74	1.28	1.47	1.08	1.61	.92	.73	1.19	.78	1.86	.97	.61	1.07	2.05	2.12
37	116	1.00	1.12	1.00	.75	1.26	.52	.24	.77	.05	1.37	.52	.22	.58	1.82	1.38
38	31061	-17.59	6.79	6.28	6.94	-4.64	3.64	6.59	4.87	-1.28	2.93	-8.72	0.00	-2.71	4.79	0.00
39	31039	4.42	5.62	2.82	2.68	4.19	2.35	.44	1.23	-1.18	2.54	1.54	2.32	.64	3.04	0.00
40	31314	7.01	6.09	3.77	4.35	5.75	3.31	2.28	2.32	1.38	4.47	3.33	2.59	2.12	4.30	0.00

FIGURE B-1A

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30808
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	.71	.20	-1.64	-.15	.07	.15	.63	-1.85	1.42	-.22	.54	.30	.90	-.09	-.02
2	19	1.05	.28	-1.48	.44	.13	.37	.37	-1.01	1.43	.23	.72	.37	.84	-.10	-.16
3	21	.79	.17	-2.10	-.33	.14	.17	.48	-1.22	1.34	.02	.71	.43	.88	-.09	.38
4	23	-.08	-.39	-2.73	-1.45	-.51	-.30	-.02	-1.63	1.19	.29	.27	.01	.64	-.43	.14
5	24	.48	.08	-3.82	-1.75	.20	.42	.57	-.96	2.08	.91	1.40	.64	1.49	.89	.69
6	112	.09	-.41	-3.01	-1.42	-.37	-.29	-.07	-1.55	.44	-.41	-.02	-.05	.13	-.60	-.51
7	113	.00	-.62	-2.76	-1.18	-.69	-.65	-.22	-1.96	.15	-.93	-.56	-.46	-.14	-.97	-.73
8	114	.21	-.29	-2.47	-.89	-.31	-.18	.16	-1.58	.62	-.43	-.03	-.22	.29	-.86	-.60
9	118	.56	-.30	-2.22	-.53	-.30	-.34	-.34	-1.58	.05	-1.61	-1.05	-.80	-.45	-1.58	-1.63
10	192	1.20	.53	-2.37	-.74	.55	.61	.88	-.61	1.64	.59	.61	.61	1.11	.69	.54
11	310	.40	-.21	-3.07	-1.48	-.13	-.14	.35	-1.47	.73	-.57	.00	-.17	.18	-.66	-.51
12	320	-.12	-.59	-3.43	-2.39	-.45	-.50	-.15	-1.58	.39	-.91	-.19	-.44	.04	-.87	-.15
13	330	.14	-.32	-2.62	-1.18	-.32	-.22	.11	-1.32	.67	-.53	.04	-.10	.34	-.57	-.17
14	340	.83	.44	-2.14	-.67	.34	.57	1.00	-.55	1.76	.76	1.26	1.10	1.48	.52	1.00
15	20	1.05	.42	-1.73	-.27	.29	.51	.80	-.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	.40	-.64	-2.74	-1.09	-.71	-.81	-.41	-1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	-.70/	.23	-2.04	-.41	-.04	.00	.40	-1.32	1.13	-.09	.36	.18	.71	-.25	-.12
18	195	-56.64	-92.09/	.20	.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	6.52	10.11	-49.12/	.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	-.77	-.04	0.00	0.00/	.26	.15	.58	-1.22	1.32	.38	.18	.22	.92	.17	-.03
21	128	-.77	.09	0.00	0.00	.20/	.26	.34	-1.34	.71	-.30	.15	.09	.32	-.52	-.27
22	641	-.18	.42	0.00	0.00	.63	.38/	.00	-1.66	1.13	-.31	.39	.13	.79	-.24	-.47
23	125	-1.47	-1.05	0.00	0.00	-.91	-1.12	-1.43/	.39	1.56	.18	1.00	.96	1.10	.34	.97
24	10068	0.00	1.02	0.00	0.00	1.35	.68	.65	1.89/	.28	-1.20	-.52	-.76	-.39	-1.19	-.95
25	30121	0.00	.12	0.00	0.00	.51	-.03	-.30	.36	-1.50/	.32	.85	.50	.71	.01	.23
26	30122	0.00	-2.98	0.00	0.00	-5.32	-5.29	-3.91	1.23	-.66	.95/	.26	-.32	.21	-.87	-.35
27	30130	0.00	.90	0.00	0.00	.46	-.47	.26	1.01	-.87	.54	-.34/	.02	.48	-.74	-.11
28	30188	0.00	.37	0.00	0.00	.95	.16	4.80	1.44	-.45	.81	.21	.48/	.39	-.89	-.47
29	30280	0.00	.10	0.00	0.00	.52	-.25	-.19	.67	-1.42	.22	-.68	-.77	-1.12/	.51	.32
30	30800	0.00	-.40	0.00	0.00	-.11	-.63	-.70	1.00	-1.20	.19	-.46	-.15	-.69	-.01/	.19
31	20284	0.00	1.38	0.00	0.00	1.87	-.06	2.00	.93	-.79	.53	-.25	-.10	-.52	.67	.06
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	-1.07	-3.57	1.77	1.10	.64	-1.74	4.18
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.12	-7.11	-9.01	-5.23	-5.94	.73	-8.49	20.01
34	30123	0.00	4.34	0.00	0.00	-.42	2.00	10.42	2.82	.77	2.08	1.42	1.75	1.32	2.21	2.09
35	127	0.00	-.60	0.00	0.00	-.40	-.83	-.97	.28	-1.65	-.80	3.31	-.77	-1.01	-.85	-.20
36	107	.27	1.34	0.00	0.00	1.30	1.17	.74	2.66	.63	1.22	5.67	2.54	1.14	1.33	1.88
37	116	.38	.86	0.00	0.00	.83	.77	.06	1.99	-.13	.63	3.09	.97	.61	1.29	1.11
38	31061	0.00	3.03	0.00	0.00	-17.97	-3.28	0.00	7.78	-2.40	8.99	8.73	2.33	-1.35	0.00	-4.38
39	31039	0.00	1.95	0.00	0.00	2.12	.93	3.72	2.39	-.62	3.29	5.45	2.24	1.44	-.94	4.62
40	31314	0.00	3.71	0.00	0.00	4.59	2.52	4.72	3.22	2.36	7.81	7.98	3.17	4.06	2.82	8.48

FIGURE B-1B

DOPPLER NAVSAT SOLUTION NSWC028907

LONGITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	.46	0.00	0.00	2.11	-.30	1.59	1.00	2.32	.80	1.72
2	19	.27	0.00	0.00	2.34	-.61	1.29	1.15	2.54	.48	1.54
3	21	.43	1.65	0.00	2.12	-.20	1.36	.98	1.58	.56	1.73
4	23	-.16	1.23	0.00	1.72	-.79	.94	.70	1.71	-.06	1.08
5	24	.77	0.00	0.00	2.87	-.01	1.56	1.36	1.64	.68	2.11
6	112	-.16	.84	-.36	1.36	-.85	.91	.60	1.31	.02	1.07
7	113	-.49	0.00	0.00	.90	-1.14	.66	.24	.43	-.24	.76
8	114	-.16	0.00	0.00	1.22	-.92	1.07	.73	1.01	.06	1.09
9	118	-.80	0.00	0.00	.74	-1.61	.72	.05	.16	-.35	.73
10	192	.74	0.00	0.00	2.25	.04	1.94	1.42	1.70	.73	1.92
11	310	-.13	.65	.47	1.37	-.93	1.05	.68	.84	-.03	1.17
12	320	-.51	1.13	-.31	1.24	-.97	.78	.45	0.00	-.08	.80
13	330	-.23	1.65	.21	1.68	-1.02	1.01	.61	.41	-.17	1.07
14	340	1.04	2.50	1.05	2.71	.46	1.91	1.74	2.51	1.25	2.41
15	20	0.00	0.00	0.00	0.00	0.00	1.78	1.41	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	.57	.30	0.00	0.00	0.00
17	105	.14	0.00	0.00	1.85	-.46	1.24	.88	1.47	.52	1.56
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.21	0.00	0.00	2.07	-.51	1.33	.91	1.31	.15	1.48
21	128	.05	0.00	0.00	1.46	-.71	1.30	.92	.69	.11	1.27
22	641	.40	0.00	0.00	1.83	-.75	.74	.07	0.00	.48	1.28
23	125	.83	1.90	.32	2.70	.71	2.64	2.21	1.87	1.45	2.67
24	10068	-.80	.81	-.35	.88	-1.64	.64	-.12	-.07	-.48	.67
25	30121	.39	1.67	.49	2.04	-.50	1.23	.72	1.78	1.15	2.28
26	30122	-.37	1.22	-.15	1.43	-.74	1.17	.32	1.44	.35	1.20
27	30130	-.13	1.49	.16	1.74	-.64	1.25	.71	.93	.01	1.32
28	30188	-.60	1.17	-.31	1.38	-1.08	.91	.55	.93	.03	1.01
29	30280	.57	1.95	.84	2.21	-.46	1.60	1.47	0.00	1.21	2.13
30	30800	.04	1.19	-.10	2.03	-.34	1.69	1.01	2.11	.87	1.76
31	20284/	-.68	1.75	.40	1.68	-.66	1.40	.80	.97	.28	1.26
32	30939	-.49/	1.49	-1.34	.07	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	-8.54	.34/	.35	1.46	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	1.63	-1.69	-.81/	1.66	-2.41	-.05	-.29	0.00	-1.21	-.12
35	127	-1.92	0.00	0.00	-6.90/	-.77	2.02	1.24	1.99	.79	1.90
36	107	1.72	0.00	0.00	-3.28	2.09/	1.00	-.38	-.73	-1.17	-.18
37	116	1.12	0.00	0.00	-2.17	1.33	-.45/	.64	.82	-.74	.41
38	31061	2.04	0.00	0.00	0.00	4.85	2.82	2.62/	1.16	-.77	0.00
39	31039	.90	0.00	0.00	-.61	3.13	-.34	1.40	4.38/	.04	1.27
40	31314	2.22	0.00	0.00	-1.89	3.98	.93	1.57	0.00	.72/	1.24

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	.22	-.20	-.08	-.22	-.36	.65	-.33	-.11	.49	-.24	-.75	.04	-.07	-.53	-.19
2	19	-.16/	.62	.12	-.00	-.32	.94	-.02	.14	.81	.19	-.58	.35	.19	-.45	.07
3	21	-.12	.12/	.16	-.20	-.42	.74	-.27	-.10	.54	-.17	-.67	.14	-.01	-.60	-.17
4	23	-.29	-.08	-.23/	.01	-.28	.96	-.14	.01	.63	-.02	-.52	.24	.13	-.45	-.04
5	24	-.20	-.20	-.35	-.18/	.29	1.15	.15	.35	.97	.23	-.25	.49	.43	-.18	.28
6	112	.80	1.15	.93	1.17	1.30/	.88	-1.02	-.78	.02	-.89	-1.44	-.61	-.71	-1.27	-.60
7	113	-.40	-.05	-.28	-.13	.05	-1.24/	.09	.17	.85	.11	-.43	.39	.30	-.27	.01
8	114	-.37	-.03	-.28	-.12	.03	-1.19	.01/	.05	.34	-.05	-.56	.22	.10	-.50	-.36
9	118	.56	1.09	.66	.82	.83	-.25	1.16	.79/	.60	-.82	-1.15	-.51	-.63	-.94	-.57
10	192	-.21	.25	-.11	.03	.20	-1.03	.17	.15	-.81/	.02	-.51	.34	.19	-.41	-.03
11	310	-.87	-.64	-.72	-.54	-.38	-1.66	-.46	-.47	-1.40	-.59/	.48	.80	.69	.08	.36
12	320	.02	.33	.16	.27	.44	-.80	.41	.43	-.72	.32	.86/	.31	-.17	-.65	-.20
13	330	-.05	.21	.03	.21	.42	-.83	.36	.32	-.73	.19	.77	-.14/	.15	-.53	-.11
14	340	-.63	-.56	-.69	-.47	-.42	-1.61	-.33	-.35	-1.24	-.52	.10	-.75	-.66/	.52	.19
15	20	-.40	.19	-.35	-.05	-.31	-1.24	-.13	.01	-.91	-.60	.35	-.32	-.39	.11/	.16
16	22	-.17	.23	-.11	.13	-.04	-.96	.18	.18	-.25	.02	.65	-.21	-.16	.42	.16
17	105	-.23	.22	-.03	.11	.30	-.96	.26	.22	-.66	.14	.64	-.23	-.11	.58	.29
18	195	78.17	72.51	28.86	81.50	55.54	52.59	76.44	51.96	5 .70	86.23	65.36	84.36	70.69	25.34	28.61
19	196	-.57	-.47	-4.69	-3.34	-12.63	-4.15	-4.49	-6.83	-5.78	-2.37	-6.91	-4.88	-4.48	-9.17	-5.21
20	27	-.93	-.68	-.91	-.79	-.68	-1.84	-.61	-.64	-1.70	-.78	-.17	-.99	-.92	-.24	-.33
21	128	.09	.37	.00	.24	.40	-.85	.39	.31	-.47	.14	.76	-.07	.04	.85	.33
22	641	-.21	.23	-.27	-.08	.20	-1.16	.11	.15	-.84	-.12	.41	-.34	-.21	.53	.46
23	125	-.98	-.80	-.92	-.73	-.69	-1.74	-.59	-.67	-1.56	-.78	-.24	-.99	-.86	-.35	-.80
24	10008	.72	1.33	.73	.61	1.56	-.61	1.77	1.46	6.06	1.01	.93	-.01	.43	.75	0.00
25	30121	-.30	.45	.42	.38	.82	-.58	.79	.65	.19	.12	.31	.07	.17	.78	0.00
26	30122	.82	3.79	.71	.49	3.71	-.43	4.93	1.96	1.94	3.85	1.04	.24	.55	1.02	0.00
27	30130	.37	.59	-.23	-.64	-.11	-1.38	.85	-.20	.16	-.20	.11	-.65	-.49	.28	0.00
28	30188	-.92	-.81	-.25	-.51	-.36	-1.34	-.05	-.35	-.77	-.89	.16	-.71	-.44	.07	0.00
29	30280	-.52	.49	.23	.03	.50	-.96	-.01	.07	7.63	-.32	.54	-.05	.09	.53	0.00
30	30800	.25	.74	.57	.64	1.20	-.66	.87	.90	-3.09	.40	.74	.29	.20	1.00	0.00
31	20264	-.44	.47	-.40	-.79	-.65	-1.49	.54	-.50	-.49	-.55	-.01	-.71	-.66	.08	0.00
32	30939	0.00	0.00	-1.12	-.00	0.00	-1.09	0.00	0.00	0.00	0.00	-.11	-.50	-.28	-2.53	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	-.43	0.00	0.00	0.00	0.00	.53	-.37	.11	-2.03	0.00
34	30123	1.47	5.75	1.29	.99	6.81	.13	6.17	2.43	.70	4.38	1.61	.83	1.11	1.49	0.00
35	127	-2.01	-1.70	-1.71	-1.67	-1.27	-2.94	-1.40	-1.48	-1.45	-2.07	-1.17	-1.30	-1.11	-.85	0.00
36	107	1.25	1.48	1.13	1.39	1.67	.45	1.57	1.60	.52	1.21	2.04	.96	1.17	2.24	1.47
37	116	-.11	-.09	-.15	.18	.52	-.89	.32	.34	-.77	-.04	.73	-.25	-.01	.95	.93
38	31001	-12.89	-40.57	-14.30	-10.72	-5.68	-8.29	-5.91	-9.57	-7.26	-9.10	-6.79	0.00	-8.06	-6.66	0.00
39	31039	-.24	.53	.11	-.08	-.11	-1.40	.91	.10	-.88	-.26	.48	-.53	-.18	-1.75	0.00
40	31314	1.86	3.50	1.57	2.13	1.26	.38	2.53	1.23	2.51	1.40	2.38	1.54	1.66	.51	0.00

FIGURE B-2A

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	-.05	-.26	.03	-1.84	-.79	.03	-.18	-1.11	.48	.31	.68	-.47	-.41	.22	.28
2	19	.14	.12	.70	-1.67	-.58	.33	.27	-.85	1.09	.52	.90	-.10	-.21	.84	.73
3	21	-.02	-.08	.66	-1.48	-.85	.05	-.29	-.92	.73	.35	.86	-.14	-.19	.16	.60
4	23	.07	.06	.59	-1.60	-.75	.25	-.07	-.73	.56	.35	.53	-.55	-.34	.03	.49
5	24	.36	.35	2.33	-.21	-.60	.41	.16	-.70	.88	.79	.59	-.18	-.12	.38	.76
6	112	-.50	-.85	.19	-1.76	-1.68	-.91	-1.07	-1.90	-.55	-.44	-.35	-1.48	-1.31	-.86	-.70
7	113	.19	.20	.71	-1.49	-.54	.41	.11	-.63	.86	.81	.77	-.10	.17	.27	.65
8	114	-.15	.08	.38	-1.87	-.66	.38	.05	-.58	.89	.69	.75	-.19	-.05	.18	.64
9	118	-.37	-.72	.06	-2.02	-1.30	-.50	-.84	-1.57	.59	.37	.82	-.60	-.40	-.08	-.32
10	192	.20	.12	.42	-1.29	-.69	.14	-.04	-.82	.78	.25	.78	-.22	-.31	.11	.39
11	310	.60	.59	1.43	-.92	-.16	.84	.38	-.18	.96	.77	1.02	.25	.23	.29	.86
12	320	-.14	-.26	.29	-1.77	-.94	-.07	-.33	-1.02	-.08	-.19	.25	-.64	-.88	-.33	.29
13	330	-.03	-.13	.63	-1.60	-.84	.01	-.17	-.93	.35	.11	.69	-.39	-.53	.00	.31
14	340	.37	.50	1.10	-1.22	-.21	.86	.46	-.34	.75	.65	1.11	.28	-.11	.36	1.03
15	20	.14	-.03	.66	-1.46	-.23	.32	.05	-.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	.01	-.05	.65	-1.34	-.61	.01	-.07	-.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	.11/	.11	.81	-1.08	-.93	.09	-.09	-.87	.68	.17	.71	-.41	-.30	.02	.33
18	195	53.44	34.28/	.52	-1.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	1.43	1.64	-20.17/	-1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	-.66	-.92	0.00	0.00/	-.69	1.06	.69	.00	1.81	1.43	1.40	.37	.62	1.23	1.48
21	128	-.00	.10	0.00	0.00	1.02/	.29	-.17	-.99	.46	.29	.30	-.63	-.31	-.25	.32
22	641	.05	-.10	0.00	0.00	.73	-.17/	-.07	-.71	1.27	1.17	1.41	.39	.57	.42	.99
23	125	-.90	-.77	0.00	0.00	-.03	-.90	-.68/	-.66	.95	.61	1.31	.39	.09	.54	1.11
24	10068	0.00	.92	0.00	0.00	2.34	1.01	1.78	1.08/	.41	-.21	.60	-.33	-.83	-.43	-.03
25	30121	0.00	-.00	0.00	0.00	1.45	.22	1.16	.94	-.03/	.18	.29	-.66	-.69	-.17	.38
26	30122	0.00	2.04	0.00	0.00	1.25	2.09	5.08	1.34	.36	.14/	.67	-.94	-1.20	-.71	-.11
27	30130	0.00	.29	0.00	0.00	-.06	-.47	.73	.39	-.53	-.84	-.99/	-.22	-.23	.30	.76
28	30188	0.00	-.80	0.00	0.00	.38	-.42	2.34	.34	-.68	-.70	-.95	.00/	-.50	.50	.97
29	30280	0.00	-.58	0.00	0.00	1.24	-.69	.28	.81	-.41	-.25	-.53	.51	.32/	-.03	.50
30	30800	0.00	.32	0.00	0.00	1.87	.54	1.10	1.13	-.16	.11	-.16	.75	.72	.13/	.55
31	20204	0.00	.07	0.00	0.00	-.02	-.83	.57	.34	-.70	-.98	-1.11	-.21	-.15	-.68	-.87
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.00	-8.49	-.07	3.98	5.41	.22	.04	-3.88
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.66	4.11	.31	1.91	2.86	.67	6.13	5.81
34	30123	0.00	2.69	0.00	0.00	.46	.10	6.38	1.75	.85	.77	.55	1.52	1.46	1.07	.78
35	127	0.00	-2.04	0.00	0.00	-.63	-1.94	-1.20	-1.35	-2.84	-2.04	-4.12	-.74	-1.12	-1.49	-2.39
36	107	1.85	1.24	0.00	0.00	2.32	1.14	1.50	2.04	.44	1.39	-2.04	2.09	2.00	1.95	1.00
37	116	.30	-.12	0.00	0.00	1.10	-.04	.19	.81	-1.34	-.49	-6.45	-1.07	.44	-.18	-.90
38	31001	0.00	-8.33	0.00	0.00	-18.73	-23.73	0.00	-13.04	-8.65	-13.68	-11.42	-6.05	.28	0.00	-9.50
39	31039	0.00	.21	0.00	0.00	-.05	-.59	1.40	-.41	-7.82	-2.04	-4.15	.15	-1.08	-8.49	-.13
40	31314	0.00	2.14	0.00	0.00	2.15	1.78	2.54	2.09	-7.10	.11	-3.30	1.59	-1.62	-1.33	4.35

FIGURE B-2B

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	-.68	0.00	0.00	1.38	-1.83	1.06	-.33	-1.35	-1.35	.04
2	19	-.09	0.00	0.00	1.87	-1.55	1.37	-.18	-.82	-.56	.50
3	21	-.28	-1.54	0.00	1.54	-1.58	1.19	-.14	-1.12	-.86	.28
4	23	-.63	-1.08	0.00	1.34	-1.86	1.40	.12	-1.79	-1.29	-.09
5	24	-.33	0.00	0.00	1.46	-1.53	1.54	.38	-.78	-.83	.01
6	112	-1.62	-.79	-.21	.14	-3.11	.18	-1.15	-2.62	-2.53	-1.56
7	113	-.32	0.00	0.00	1.64	-1.56	1.49	.20	-.50	-.80	-.04
8	114	-.38	0.00	0.00	1.46	-1.57	1.60	.33	-.92	-.98	.09
9	118	-.93	0.00	0.00	1.09	-2.15	.54	-.82	-1.24	-1.27	-.37
10	192	-.38	0.00	0.00	1.46	-1.86	1.24	-.12	-.84	-.98	.00
11	310	.12	-.83	.01	1.88	-1.02	1.98	.62	-.49	-.23	.69
12	320	-.73	-.69	-.30	.60	-1.97	1.02	-.38	0.00	-1.24	-.28
13	330	-.56	-.30	.29	.95	-2.07	1.03	-.22	-1.43	-1.54	-.47
14	340	.08	-.01	.61	1.28	-1.07	1.92	.65	-1.36	-.60	.48
15	20	0.00	0.00	0.00	0.00	0.00	1.29	.41	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	1.25	-.10	0.00	0.00	0.00
17	105	-.66	0.00	0.00	1.53	-1.88	1.17	-.22	-1.35	-1.19	-.11
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.25	0.00	0.00	2.29	-.89	2.22	.94	-.63	-.50	.61
21	128	-.72	0.00	0.00	.94	-2.04	1.10	-.13	-.89	-1.34	-.33
22	641	.26	0.00	0.00	2.45	-1.07	1.36	.09	0.00	-.11	.81
23	125	.33	.01	.77	1.53	-1.05	2.14	.77	-.72	-.33	.76
24	10068	-.51	-.93	.53	.72	-2.37	.64	-1.16	-2.45	-1.48	-.26
25	30121	-.81	-.47	-.16	.72	-2.13	1.39	-.55	-1.90	-1.26	-.47
26	30122	-1.09	-1.02	-.61	.37	-2.31	.67	-1.15	-2.02	-1.45	-.44
27	30130	-.23	-.11	.32	1.38	-1.38	1.69	-.13	-1.04	-.74	.30
28	30188	.07	.27	.91	1.37	-1.39	1.75	.21	-1.11	-.69	.19
29	30280	-.49	-.27	.17	.90	-1.74	1.49	-.45	0.00	-1.46	-.24
30	30800	-.89	-1.42	-.67	.63	-2.16	1.05	-.89	-.72	-.93	-.44
31	20284/	-.40	.04	.49	1.54	-1.19	1.92	.18	-.43	-.65	.43
32	30939	3.65/	-.51	.44	.98	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	.51	.15/	.06	.42	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	1.64	1.76	-2.64/	1.08	-3.12	.18	-1.94	0.00	-2.44	-1.23
35	127	-.65	0.00	0.00	-4.42/	-1.05	3.37	1.48	.54	.77	1.59
36	107	2.04	0.00	0.00	-4.38	3.49/	1.45	-1.27	-2.71	-2.45	-1.53
37	116	-.70	0.00	0.00	-9.67	1.62	-1.21/	.12	-.44	-.42	.32
38	31061	-4.47	0.00	0.00	0.00	-6.20	-6.84	-6.65/	-.97	.50	0.00
39	31039	-.07	0.00	0.00	-5.94	1.21	-2.27	1.97	16.89/	-.97	1.03
40	31314	1.87	0.00	0.00	-1.84	2.32	.05	2.69	0.00	2.00/	.05

DOPPLER NAVSAT SOLUTION   NSWC820907

HEIGHT POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	.79	-1.15	.09	.84	.06	-.22	-1.02	-.44	.18	.22	-.33	-.13	.88	1.28	-.24
2	19	-1.17/	.28	1.13	1.82	1.06	.77	.02	.54	1.16	1.33	.86	1.11	2.08	2.38	1.05
3	21	.14	1.18/	.98	.78	-.13	-.35	-1.19	-.63	-.03	.08	-.39	-.40	.67	1.19	-.35
4	23	1.11	2.06	.97/	1.81	-.82	-1.05	-1.93	-1.39	-.31	-.63	-1.17	-1.16	-.02	.58	-.54
5	24	.43	1.48	.08	-.83/	.88	-.21	-1.04	-.42	.50	.23	-.35	-.30	.83	1.31	.30
6	112	-.22	.70	-.42	-1.29	-.55/	.60	-.85	-.28	.30	.44	-.04	-.01	1.00	1.47	-.05
7	113	-.93	.11	-1.18	-2.11	-1.29	-.77/	.23	.55	1.30	1.24	.81	.81	1.82	2.38	.94
8	114	-.84	.17	-1.00	-1.91	-1.09	-.60	.17/	.27	.27	.82	.32	.27	1.40	1.75	-.33
9	118	-.74	.34	-1.10	-1.63	-1.29	-.53	.35	.08/	.80	.19	-.37	-.14	.81	.77	-1.02
10	192	.13	1.27	-.03	-.90	-.11	.38	1.14	1.04	.76/	1.07	-.38	-.50	.74	1.16	-.62
11	310	-.23	.97	-.37	-1.30	-.53	.04	.85	.67	.68	-.27/	.61	.01	1.05	1.65	.27
12	320	-.39	.85	-.66	-1.59	-.89	-.24	.54	.34	.11	-.63	-.23/	.53	1.03	1.47	-.39
13	330	.82	2.08	.53	-.32	.43	.92	1.67	1.64	1.51	.74	.92	1.13/	1.66	.50	-.98
14	340	1.65	2.68	1.42	.57	1.26	1.79	2.62	2.47	2.25	1.51	1.81	2.01	.89/	2.08	-1.11
15	20	.15	1.83	-.19	-.69	.11	.50	1.18	.88	.12	.61	.35	.53	-.19	-1.30/	.41
16	22	.46	1.34	-.11	-.91	-.04	.29	1.26	.84	-.16	.08	.38	.45	-.04	-1.22	-.07
17	105	-.63	.48	-.86	-1.81	-.96	-.41	.34	.18	.17	-.77	-.48	-.25	-1.42	-2.33	-.89
18	195	38.25	33.58	59.11	101.06	69.62	58.94	66.27	49.25	52.36	80.39	71.09	64.10	53.23	113.85	64.77
19	196	1.32	9.71	11.23	15.54	-4.68	9.49	12.70	6.27	9.74	10.02	12.39	6.78	6.82	17.96	12.05
20	27	.50	1.55	.30	-.57	.21	.74	1.44	1.32	1.03	.41	.60	.91	-.29	-1.18	.25
21	126	-2.16	-1.20	-2.32	-3.20	-2.48	-1.88	-1.18	-1.37	-1.39	-2.45	-2.13	-1.50	-3.05	-3.79	-1.86
22	641	-.31	.75	-.44	-1.53	-.58	-.05	.51	.42	1.09	-.49	-.34	.07	-1.27	-2.08	-.04
23	125	-.19	1.23	-.26	-1.01	-.41	.25	.88	.69	.56	-.27	.16	.50	-.95	-1.62	.05
24	10068	-.93	-.11	-.88	-1.29	-.97	-.46	.71	.82	.19	-.44	-.40	-.40	-2.01	-1.90	0.00
25	30121	-.04	.17	-.48	-.94	-.23	.19	.83	1.21	.67	.13	-.12	.13	-1.78	-1.65	0.00
26	30122	-.41	-.81	-1.55	-2.12	-4.51	-1.29	3.70	3.96	-.16	3.77	-1.07	-1.10	-2.81	-2.83	0.00
27	30130	-4.00	-1.31	-.41	-.98	-4.73	.22	-1.23	-.72	-.56	-1.73	.15	.51	-1.02	-1.45	0.00
28	30188	-.04	1.34	.01	-.18	.30	.51	.34	1.72	.54	.42	.31	.66	-1.04	-1.12	0.00
29	30280	-4.87	-.47	-1.20	-1.44	-1.02	-.68	.66	.82	-2.61	-.26	-.67	-.56	-2.53	-2.24	0.00
30	30800	.35	1.18	.12	-.28	.63	.83	1.97	2.17	.91	.94	.68	.72	-1.06	-.91	0.00
31	20284	-1.71	1.00	-.64	-1.15	-1.97	-.03	2.03	2.23	2.00	1.06	-.13	.04	-1.38	-1.69	0.00
32	30939	0.00	0.00	-1.06	-1.55	0.00	-.63	0.00	0.00	0.00	0.00	-.30	.04	-.78	.23	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	-1.69	0.00	0.00	0.00	0.00	-1.38	-1.55	-1.83	3.45	0.00
34	30123	2.01	3.28	-.78	-.80	-5.91	.19	7.54	7.73	-3.07	7.93	.27	.15	-1.47	-1.30	0.00
35	127	-.48	.25	-.33	-.93	-.41	.20	1.01	1.23	.99	-.05	-.28	-1.54	-5.75	-1.66	0.00
36	107	-1.25	-.56	-1.40	-2.55	-1.72	-1.11	-.33	-.41	-.74	-1.48	-1.42	-.82	-2.52	-3.26	-1.35
37	116	-1.36	-.55	-1.34	-2.46	-1.61	-.98	-.33	-.29	-.63	-1.49	-1.34	-.88	-2.45	-3.15	-1.34
38	31061	-14.46	-18.32	4.03	-7.89	11.40	-1.75	-11.73	-7.75	-6.06	-7.56	-9.70	0.00	-7.41	-10.29	0.00
39	31039	-1.22	.81	.07	.77	-1.97	-.35	1.44	2.29	1.72	1.40	.50	-.77	-4.30	-.78	0.00
40	31314	-3.49	.40	-2.79	-.79	-3.74	-2.31	-.32	.17	-.54	-1.13	-1.50	-3.26	-7.36	-2.77	0.00

FIGURE B-3A

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	-.25	-.70	5.45	1.17	.41	-2.38	-.34	-.02	-.71	.03	-1.49	-.22	.19	-.91	.45
2	19	.71	.38	5.96	1.98	1.52	-1.29	.74	1.18	.46	.34	-.39	1.33	1.61	.43	1.68
3	21	-.52	-.88	5.41	1.20	.28	-2.55	-.44	-.15	-.89	-.50	-1.74	-.33	.01	-1.21	.09
4	23	-.92	-1.71	5.38	1.38	-.50	-3.47	-1.33	-1.11	-1.33	-.95	-2.23	-.90	-.24	-1.44	-.31
5	24	-.03	-.78	7.62	2.73	.22	-2.71	-.50	-.48	-1.10	-.24	-2.04	-.58	.00	-1.23	.40
6	112	-.23	-.46	5.33	1.28	.69	-2.07	-.05	.30	-.52	-.02	-1.32	.34	.44	-.85	.84
7	113	.82	.31	6.50	2.38	1.43	-1.42	.52	1.04	.30	.78	-.71	.94	1.23	.34	1.46
8	114	-.35	-.05	5.12	.79	1.12	-1.45	.26	.97	.69	1.16	-.26	1.19	1.66	.68	1.87
9	118	-1.37	-.70	4.58	.33	.37	-1.32	.02	.66	.66	.75	-.35	.49	1.34	-.06	1.10
10	192	-.77	-.86	5.14	.88	.33	-2.53	-.57	-.18	-.47	.09	-1.16	.11	.29	-.44	.71
11	310	.07	-.50	6.07	1.94	.59	-2.29	-.36	.29	-.41	-.15	-1.06	.16	.31	-.63	.60
12	320	-.45	-.38	4.87	.59	.81	-1.73	.03	.60	-.23	-.26	-1.07	.38	.62	-.75	.56
13	330	-.98	-1.52	4.53	.33	-.37	-3.10	-1.37	-.78	-1.69	-1.76	-2.42	-1.02	-.88	-2.28	-1.08
14	340	-1.34	-2.24	4.35	.57	-1.07	-4.04	-1.93	-1.67	-1.67	-1.69	-2.68	-1.43	-.83	-2.16	-.92
15	20	-.27	-.78	5.41	1.26	.48	-1.69	.23	.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	.48	-.53	5.98	1.75	.54	-2.18	-.04	.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	-.79/	.15	6.48	2.05	1.14	-1.77	.44	.71	-.09	.38	-.88	.47	.95	-.18	1.03
18	195	108.97	75.54/	5.50	-4.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	11.70	9.32	-.05/	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.27	1.14	0.00	0.00/	1.41	-2.91	-.75	-.45	-.98	-.44	-1.94	-.47	-.21	-.96	.18
21	128	-1.93	-1.54	0.00	0.00	-2.72/	1.47	1.63	2.57	1.59	2.36	.63	2.37	2.58	1.55	2.94
22	641	-.56	.44	0.00	0.00	-.80	1.72/	.56	.30	-.26	.26	-1.36	.09	.24	.33	.75
23	125	.14	.71	0.00	0.00	-.55	2.14	.23/	.96	-.30	-.34	-1.25	.04	.45	-.82	.44
24	10068	0.00	-.17	0.00	0.00	-.92	1.86	-.07	-.41/	.27	-.00	-.90	.16	.80	-.61	.75
25	30121	0.00	.34	0.00	0.00	-.42	2.46	.26	-.17	.35/	.27	-1.01	.21	.87	-.42	.71
26	30122	0.00	-.22	0.00	0.00	3.93	2.79	-3.66	-1.33	-.83	-1.29/	.67	1.12	1.77	.41	1.58
27	30130	0.00	-2.74	0.00	0.00	-3.41	-1.30	-2.93	.05	.19	.04	1.11/	.76	.57	-.68	.43
28	30188	0.00	.83	0.00	0.00	-.17	2.74	-5.87	.41	.83	.59	1.83	.59/	1.11	-1.36	-.09
29	30280	0.00	-.12	0.00	0.00	-.77	1.96	.39	-.74	-.38	-.64	.56	-.54	-1.08/	.30	1.05
30	30800	0.00	1.13	0.00	0.00	.44	3.34	1.10	.46	.87	.71	1.73	.48	.06	1.01/	1.25
31	20284	0.00	.17	0.00	0.00	-.21	1.96	.18	-.32	.28	-.05	1.11	-.25	-.39	.58	-.55
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-.17	1.58	-1.50	3.39	.90	-1.21	1.83	-7.10
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.72	7.18	-3.23	2.57	-.39	-2.56	3.45	-8.76
34	30123	0.00	2.82	0.00	0.00	6.30	5.28	1.98	.08	.61	.09	1.42	.45	-.27	.99	-.24
35	127	0.00	.21	0.00	0.00	-.53	2.40	.43	.01	.43	-.18	-4.29	2.02	-.63	.40	-.92
36	107	-1.06	-.82	0.00	0.00	-1.92	1.20	-.75	-1.36	-.89	-1.37	-2.23	.07	-1.60	-.75	-2.30
37	116	-.83	-.70	0.00	0.00	-1.92	1.21	-.93	-1.53	-.88	-1.62	-1.75	.18	-1.95	-1.35	-2.47
38	31061	0.00	-6.65	0.00	0.00	-14.96	-5.75	0.00	-7.69	-3.06	-4.14	1.07	-13.42	-16.60	0.00	-1.53
39	31039	0.00	-.29	0.00	0.00	-.44	1.74	-.55	.77	-.43	4.04	.21	3.17	4.00	10.07	-.26
40	31314	0.00	-1.94	0.00	0.00	-1.70	-.83	-1.57	-1.44	-6.80	-.71	-5.36	1.37	.11	.30	-.23

FIGURE B-3B

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT POSITION METERS

VALUES ON AND ABOVE THE DIAGONAL ARE MEAN COORDINATES.
VALUES BELOW THE DIAGONAL ARE VALUES FROM LINEAR FIT EVALUATED AT 1980.0

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	-.15	0.00	0.00	.20	-.00	-1.20	-1.18	-1.59	.29	-.91
2	19	1.32	0.00	0.00	2.01	1.05	-.42	-.45	-.69	1.65	.64
3	21	-.66	-.31	0.00	-.43	-.41	-1.40	-1.28	-1.69	-.35	-1.36
4	23	-1.18	-.82	0.00	-.51	-.92	-2.62	-2.53	-2.09	-.61	-1.92
5	24	-.73	0.00	0.00	-.36	-.33	-1.78	-1.66	-3.10	-.18	-1.30
6	112	.07	.20	-1.27	.08	.47	-1.05	-.95	-1.50	.81	-.34
7	113	.75	0.00	0.30	1.23	.91	-.29	-.23	-.01	1.19	-.88
8	114	1.03	0.00	0.00	1.62	1.24	-.29	-.12	-.04	1.38	.31
9	118	.66	0.00	0.00	1.83	.55	-.50	-.47	-.54	1.02	-.19
10	192	-.19	0.00	0.00	.42	.02	-1.38	-1.40	-1.02	.36	-.95
11	310	-.15	.73	-1.01	.33	.02	-1.13	-1.06	-1.24	.28	-.84
12	320	-.07	1.01	-1.04	-.23	.57	-.60	-.56	0.00	.75	-.31
13	330	-1.39	-.25	-1.82	-1.66	-1.16	-1.88	-1.90	-3.09	-.73	-2.00
14	340	-1.68	-.40	-2.27	-1.45	-1.58	-3.11	-3.12	-2.59	-1.29	-2.54
15	20	0.00	0.00	0.00	0.00	0.00	-1.57	-1.41	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	-1.82	-1.78	0.00	0.00	0.00
17	105	.28	0.00	0.00	.99	.43	-.72	-.58	-1.12	.83	-.36
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	-.66	0.00	0.00	.03	-.49	-1.80	-1.81	-1.56	-.26	-1.45
21	128	2.05	0.00	0.00	2.47	2.38	1.34	1.36	.90	2.56	1.40
22	641	-.04	0.00	0.00	.68	.40	-.79	-.94	0.00	-.31	-.72
23	125	-.32	.97	-1.11	-.14	.05	-1.37	-1.35	-1.25	.27	-.88
24	10068	.08	1.02	-.83	.28	.54	-.91	-.82	-1.44	.60	-.26
25	30121	-.03	1.28	-.58	-.02	-.06	-1.37	-1.61	-1.01	.30	-.91
26	30122	.92	2.06	.18	1.21	1.36	-.12	.06	-.56	1.41	.60
27	30130	-.28	.91	-1.02	.23	-.11	-1.64	-1.45	-.90	-.06	-.81
28	30188	-.62	.23	-1.68	-.67	-.37	-1.67	-1.83	-1.30	-.17	-1.12
29	30280	.47	1.78	-.14	.69	.63	-.61	-1.33	0.00	.84	-.28
30	30800	-.54	.35	-.92	-.32	-.59	-2.15	-2.33	-1.93	-.03	-1.37
31	20284/	---.42	1.37	-.54	.23	.20	-1.14	-1.23	-1.31	.57	-.81
32	30939	-1.27/	--1.32	-1.87	-1.54	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	-2.67	-1.32/	---.58	.44	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	.31	-2.49	2.90/	---.50	-.35	-1.54	-1.24	0.00	-.29	-1.26
35	127	-.73	0.00	0.00	-6.11/	---.97	-1.47	-1.35	-.75	.00	-.96
36	107	-2.55	0.00	0.00	-5.89	-1.34/	---.30	.08	.28	2.02	.47
37	116	-1.26	0.00	0.00	-2.82	-1.32	.05/	---.21	.16	1.71	.72
38	31061	-9.21	0.00	0.00	0.00	2.14	-10.62	-1.47/	---.93	1.82	0.00
39	31039	.00	0.00	0.00	-2.08	.88	2.27	2.99	5.28/	--1.26	-1.08
40	31314	-1.75	0.00	0.00	-8.08	-1.12	.38	.04	0.00	-2.06/	---.10

FIGURE B-3C

APPENDIX C

RATES OF CHANGE OF STATION COORDINATES

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	-4.10	2.60	4.11	-9.95	-12.63	-2.45	2.37	-1.41	18.96	-.50	-2.89	-6.97	-4.47	-9.58	-5.08
2	19	5.91/	-1.32	.59	-7.90	-22.60	-9.52	-2.16	-6.80	10.91	-10.51	-7.68	-9.79	-8.50	-15.56	-11.96
3	21	3.20	5.00/	-1.02	-10.30	-17.68	-6.43	-.65	-6.74	9.57	-5.93	-5.63	-11.13	-9.87	-14.31	-8.34
4	23	3.71	5.88	2.82/	-8.45	-6.17	4.35	11.11	5.03	20.94	3.96	5.31	.35	1.69	-3.43	1.59
5	24	4.26	5.77	3.27	3.72/	-18.32	12.00	17.95	11.74	30.01	11.50	12.76	8.75	10.58	3.21	12.61
6	112	3.03	4.32	1.83	2.87	3.14/	-5.45	6.95	.19	18.19	-1.01	2.05	-3.76	-1.26	-8.31	-2.26
7	113	3.10	4.71	1.96	2.68	3.27	1.72/	-.17	-5.06	10.81	-6.51	-5.59	-10.65	-8.61	-14.07	-5.55
8	114	3.19	4.71	2.26	2.89	3.60	2.07	1.81/	-6.31	16.34	1.54	1.44	-5.85	-1.86	-8.46	-.98
9	118	4.73	6.13	3.67	4.50	5.18	3.76	3.65	3.60/	-10.23	-16.77	-15.25	-22.35	-18.78	-25.43	-14.05
10	192	4.73	5.89	3.36	4.11	4.35	3.32	3.12	3.29	4.72/	-4.54	3.70	-3.39	-2.07	-6.35	9.21
11	310	3.88	5.26	2.43	3.37	3.62	2.34	2.26	2.76	4.16	3.52/	-4.61	-6.13	-3.44	-9.38	.40
12	320	3.45	5.14	2.25	3.17	3.37	2.32	2.04	2.27	4.24	3.32	2.53/	-9.50	1.13	-4.04	4.76
13	330	3.34	4.87	2.20	2.86	3.51	1.86	1.66	1.86	3.47	3.23	2.42	2.25/	-7.42	-4.70	3.31
14	340	3.31	4.83	2.73	2.89	3.58	2.52	2.41	2.57	4.25	3.80	3.18	2.83	2.58/	-13.71	5.32
15	20	5.13	7.83	3.60	4.32	5.70	4.08	3.50	3.91	7.58	6.36	4.73	4.10	3.31	4.10/	-8.20
16	22	3.88	6.37	3.39	4.19	5.15	2.84	2.96	2.99	6.77	5.03	4.09	3.05	3.29	3.32	3.13
17	105	3.70	5.26	2.40	3.30	3.71	2.06	1.97	2.03	4.07	3.58	2.61	2.29	1.97	2.60	4.06
18	195	593.17	846.65	438.99	521.86	586.78	594.14	448.60	558.61	485.33	867.56	696.97	541.69	641.97	657.01	357.65
19	196	174.49	231.19	176.55	178.08	236.04	158.65	168.84	183.96	186.20	180.05	150.57	140.09	170.65	174.13	191.82
20	27	4.39	7.40	3.16	4.06	4.19	3.36	3.13	3.22	4.73	4.40	3.66	3.46	3.40	3.93	5.64
21	128	9.74	14.68	5.84	7.49	8.43	5.44	5.20	5.88	8.83	7.72	6.49	6.49	5.35	6.83	7.99
22	641	9.67	16.14	5.06	7.01	7.99	5.75	5.51	5.96	9.24	7.65	6.83	5.93	5.90	6.49	7.74
23	125	11.77	17.72	7.77	8.78	9.88	6.33	7.82	6.55	11.30	9.46	9.92	5.67	5.39	7.25	10.63
24	10068	57.01	66.52	19.49	28.74	46.90	18.71	45.18	32.79	317.03	30.58	17.93	14.84	16.28	17.64	0.00
25	30121	51.84	40.67	28.76	28.14	26.80	18.95	32.68	26.99	62.93	23.65	21.78	15.55	18.56	23.46	0.00
26	30122	292.07	452.59	33.36	44.41	269.98	13.85	260.35	224.74	403.36	203.17	23.56	15.40	14.93	17.62	0.00
27	30130	158.40	138.30	15.45	29.77	105.02	12.49	73.04	70.94	138.52	89.15	10.96	9.33	10.20	14.02	0.00
28	30188	40.21	57.97	16.77	18.51	47.11	11.99	60.71	29.88	90.07	39.77	15.29	14.15	13.68	14.22	0.00
29	36280	406.22	78.70	19.30	30.38	51.03	14.82	36.98	32.40	385.40	31.72	13.89	18.06	15.44	20.20	0.00
30	30800	44.57	56.62	28.83	29.02	35.18	19.61	55.85	39.35	237.78	41.42	32.39	17.67	21.46	19.02	0.00
31	20284	150.18	156.72	16.67	30.06	118.12	12.51	75.91	66.70	134.93	94.35	11.96	9.34	10.08	14.58	0.00
32	30939	0.00	0.00	18.20	40.72	0.00	31.33	0.00	0.00	0.00	0.00	18.14	31.95	29.23	138.38	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	49.44	0.00	0.00	0.00	0.00	29.15	41.52	47.33	516.20	0.00
34	30123	424.75	644.90	40.64	44.87	573.47	21.77	400.29	309.41	508.35	296.33	28.05	20.03	20.23	22.07	0.00
35	127	43.65	46.47	22.42	28.98	30.63	20.19	31.62	22.79	166.89	21.74	29.83	94.19	82.85	34.54	0.00
36	107	15.55	19.42	7.94	12.75	13.81	8.35	8.61	8.33	20.78	12.17	8.58	12.44	9.23	13.04	30.47
37	116	17.30	23.13	10.10	12.55	14.71	9.77	10.62	11.42	23.27	15.79	10.98	15.01	11.57	13.64	24.71
38	31061	767.90	1856.75	569.76	1323.61	780.60	1285.28	884.52	774.46	657.67	546.81	798.79	0.00	610.25	1684.56	0.00
39	31039	175.93	154.25	124.80	96.74	132.76	105.96	97.56	89.42	186.33	123.12	100.52	138.35	115.97	124.78	0.00
40	31314	199.55	186.10	80.77	146.37	120.45	84.73	120.28	85.17	180.46	94.98	85.25	94.95	109.65	109.36	0.00

FIGURE C-1A

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.80	-78.85	108.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	2.43	2.78	*******	87.34	-.41	-7.01	20.76	-26.27	-96.00	-179.23	-34.02	-311.34	-29.36	-969.66	-7.50
2	19	2.18	-1.07	33.65	49.20	-1.39	-3.72	9.08	-55.84	51.56	-47.61	-180.92	-497.49	48.96	-27.71	62.83
3	21	-2.52	-3.09	*******	85.88	-5.85	-16.16	3.55	-40.44	22.56	-26.77	38.00	25.56	22.25	-8.11	-7.19
4	23	11.33	6.18	*******	-59.77	9.24	-7.39	20.05	-36.81	-11.67	-86.42	-5.68	-22.15	-38.26	-38.48	-29.49
5	24	24.08	17.11	*******	165.53	7.89	-3.94	19.58	-27.96	2.98	-130.60	527.38	-199.28	14.88	-86.39	27.40
6	112	5.13	6.75	-733.48	115.03	-.77	-7.29	15.81	-34.76	37.94	-37.41	-5.51	5.20	29.04	-10.29	49.01
7	113	-.11	-.70	*******	74.32	-3.93	-13.35	11.31	-38.39	16.05	-143.77	728.18	-21.55	59.80	-112.62	55.73
8	114	4.31	3.10	*******	-1.41	4.22	-6.02	26.85	-38.70	4.67	-115.08	626.52	-36.70	26.82	-71.39	52.86
9	118	-7.88	-11.84	-887.72	86.80	-15.67	-15.35	-5.78	-56.58	-217.59	-225.77	584.97	175.20	25.76	-470.44	757.89
10	192	13.88	8.11	-998.84	103.84	-4.65	-13.07	3.42	-41.62	-37.75	-147.51	556.84	-77.90	-17.76	-106.88	24.38
11	310	7.52	7.36	*******	135.80	-5.37	-13.08	-2.05	-28.46	4.40	-31.12	-7.14	-1.67	24.08	-19.60	28.04
12	320	12.24	10.05	*******	7.81	2.75	-1.08	18.18	-35.00	28.77	-4.23	5.24	7.68	29.81	4.97	-3.46
13	330	7.97	6.40	*******	40.19	6.27	-7.77	14.43	-41.22	-7.01	-38.16	-27.98	-4.04	-.05	-31.12	-41.61
14	340	17.51	10.70	*******	16.09	11.63	-6.69	25.61	-38.24	29.16	-10.15	3.80	8.42	24.25	6.19	2.92
15	20	6.93	3.14	*******	1.69	3.08	-10.94	14.53	-46.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	.88	-2.40	-878.35	127.11	-4.12	-12.65	13.63	-56.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	3.24/	.37	*******	175.17	-.88	-16.53	9.22	-31.79	26.73	-108.84	513.10	-95.97	63.49	-88.25	60.99
18	195	441.10	354.45/	*******	-808.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	219.33	387.29	861.11/	100.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	3.67	4.27	0.00	0.00/	-2.93	-10.37	11.88	-40.76	-8.77	-128.68	825.62	-29.72	-5.81	-92.73	19.66
21	128	6.85	5.86	0.00	0.00	6.74/	-7.03	18.26	-26.98	7.72	-115.26	813.68	71.45	27.51	-65.67	74.80
22	641	6.48	6.40	0.00	0.00	6.24	7.52/	22.48	-70.19	121.57	-115.06	633.86	-9.45	-585.11	-36.71	71.51
23	125	8.01	7.58	0.00	0.00	9.06	9.94	9.63/	32.42	59.10	25.51	49.82	52.16	54.07	39.58	22.08
24	10068	0.00	33.33	0.00	0.00	38.95	48.70	46.10	17.76/	18.86	-36.18	-22.26	-19.62	-7.76	-24.83	-56.53
25	30121	0.00	22.66	0.00	0.00	26.49	31.59	27.87	16.17	21.56/	27.94	12.99	6.19	11.56	19.18	-7.74
26	30122	0.00	213.50	0.00	0.00	350.58	315.33	276.29	15.33	17.08	13.86/	12.81	-3.38	-.75	17.72	-31.38
27	30130	0.00	78.57	0.00	0.00	121.53	92.08	162.39	12.68	14.94	15.29	13.57/	4.55	-.85	-2.99	-25.34
28	30188	0.00	29.72	0.00	0.00	29.42	34.78	669.90	13.53	17.18	18.40	16.50	13.06/	1.46	-21.93	-43.85
29	30280	0.00	31.30	0.00	0.00	47.18	39.38	53.19	18.75	20.72	21.23	17.05	12.24	21.19/	7.94	-45.00
30	30800	0.00	34.69	0.00	0.00	33.18	45.13	42.72	20.42	20.66	25.27	21.19	22.12	18.98	27.26/	17.87
31	20284	0.00	76.64	0.00	0.00	105.80	102.27	152.61	13.26	12.92	14.09	13.75	6.67	12.49	10.25	24.33
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.90	144.78	143.79	171.82	194.95	33.82	138.89	161.98
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.56	207.90	370.59	362.37	367.54	40.29	457.02	486.23
34	30123	0.00	389.46	0.00	0.00	557.73	361.66	442.44	21.83	22.54	23.98	25.73	19.93	17.99	25.66	25.96
35	127	0.00	19.59	0.00	0.00	30.47	29.16	36.27	34.87	34.81	19.52	228.89	88.91	35.88	38.53	31.33
36	107	20.84	8.42	0.00	0.00	10.64	9.61	14.91	12.68	30.42	30.60	267.51	38.65	27.62	17.73	44.21
37	116	32.44	9.94	0.00	0.00	12.41	12.38	16.49	16.20	57.91	37.93	413.80	174.69	46.59	82.44	55.23
38	31061	0.00	767.28	0.00	0.00	2307.91	834.21	0.06	953.21	904.40	941.61	1227.17	842.29	1758.97	0.00	828.86
39	31039	0.00	91.69	0.00	0.00	143.41	129.88	282.83	125.56	266.80	295.27	281.76	113.77	296.84	472.87	135.98
40	31314	0.00	97.27	0.00	0.00	113.59	122.76	188.73	113.47	368.41	263.37	245.87	70.25	374.67	244.93	183.32

FIGURE C-1B

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	-395.96	0.00	0.00	*******	-62.89	-16.45	-.00	3688.04	-512.00	-744.17
2	19	-505.12	0.00	0.00	*******	14.38	1.59	11.52	-793.58	-673.41	-593.19
3	21	32.16	-33.32	0.00	-8.55	-3.68	-12.25	-2.74	-872.69	-281.16	-257.38
4	23	-22.47	-84.69	0.00	[illegible]	-55.20	-17.42	-6.86	-993.48	-333.05	-407.75
5	24	-340.66	0.00	0.00	-662.06	-39.87	-6.82	14.70	1173.90	-420.60	-456.02
6	112	3.52	-28.38	105.17	22.54	8.77	-1.67	11.13	-443.90	-283.37	-278.92
7	113	-89.80	0.00	0.00	-341.33	9.15	-6.85	.16	*******	-85.82	-193.11
8	114	-12.58	0.00	0.00	-232.83	19.19	-15.11	-5.11	-722.14	-154.86	-159.66
9	118	-16.58	0.00	0.00	313.70	194.50	-10.15	1.10	269.10	124.37	-96.11
10	192	-109.52	0.00	0.00	-362.12	-31.60	11.93	11.83	-231.29	-223.98	-322.61
11	310	-3.22	-16.58	86.18	13.16	12.19	9.47	20.98	1792.25	-195.01	-274.61
12	320	19.99	8.74	111.09	-4.91	-23.05	15.44	20.83	0.00	-282.38	-216.62
13	330	3.03	10.18	112.70	-19.24	138.07	-6.53	4.68	582.58	-102.63	-134.39
14	340	23.11	-7.35	-239.52	.42	-13.73	-14.94	-8.57	-421.82	-218.13	-236.71
15	20	0.00	0.00	0.00	0.00	0.00	-21.93	2.68	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	18.46	-3.98	0.00	0.00	0.00
17	105	-161.74	0.00	0.00	-374.31	25.92	-10.93	3.48	-292.10	-182.50	-279.78
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	-208.46	0.00	0.00	374.96	-21.88	3.49	10.57	3468.36	-234.48	-392.85
21	128	13.43	0.00	0.00	-80.11	22.27	15.48	20.44	737.35	-99.82	-157.96
22	641	-206.07	0.00	0.00	*******	50.56	-.32	1.93	0.00	-412.49	-444.94
23	125	62.80	15.86	121.51	32.22	63.62	-2.04	22.03	*******	-115.07	-69.41
24	10068	.30	-124.23	-414.17	-21.12	2.06	3.08	1.89	435.04	22.06	-249.42
25	30121	19.83	-347.99	-584.48	4.98	125.29	122.38	114.65	*******	-334.80	-805.30
26	30122	16.70	33.21	-311.94	-2.55	-614.56	-693.03	-425.63	*******	-806.86	-987.26
27	30130	6.36	-23.85	-374.30	2.48	16.01	-165.00	-35.53	-262.32	-282.43	-235.61
28	30188	12.54	-36.52	68.92	-9.15	-16.59	-48.18	-13.58	428.11	-219.08	-443.84
29	30280	13.24	-243.16	-573.09	-.36	90.98	98.25	100.28	0.00	336.85	-104.47
30	30800	32.67	201.98	1237.49	21.29	-32.76	-50.91	-39.33	1220.63	-528.69	-927.80
31	20284	-4.23	-136.42	-548.40	-16.16	160.58	-41.04	-42.03	-198.09	-78.08	-125.16
32	30939	227.57	-35.53	109.22	-118.31	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	335.49	51.54	-78.43	-142.70	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	19.71	285.77	427.93	-15.28	675.87	485.65	280.50	0.00	-91.40	259.09
35	127	80.19	0.00	0.00	326.37	-7.38	-16.12	-28.27	-533.19	-287.10	-258.89
36	107	39.87	0.00	0.00	230.95	25.42	-3.30	8.47	-662.60	-100.46	-138.80
37	116	186.87	0.00	0.00	727.87	41.55	11.61	-6.30	-336.40	-291.18	-144.88
38	31061	826.45	0.00	0.00	0.00	314.23	1151.17	2363.44	-75.13	-962.78	0.00
39	31039	99.80	0.00	0.00	311.43	95.85	125.49	170.53	406.19	-243.87	68.71
40	31314	82.80	0.00	0.00	450.31	87.74	89.85	162.75	0.00	126.22	-260.43

FIGURE C-1C

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	3.99	1.74	-2.11	-5.09	5.72	11.75	-4.41	-14.66	1.85	1.93	-8.34	-.99	1.16	-5.47	-5.52
2	19	5.17/	.69	-.15	-5.26	6.45	12.90	-1.69	-9.76	9.12	5.35	-4.08	-1.26	1.18	-5.60	2.86
3	21	2.18	4.43/	2.46	-2.95	4.56	13.74	-.95	-12.25	3.99	4.88	-4.83	1.77	3.80	-5.46	-4.91
4	23	2.74	5.16	2.25/	.33	8.08	17.57	1.25	-9.82	6.73	4.89	-2.35	3.19	6.53	-1.58	-.11
5	24	3.14	5.16	2.49	2.94/	7.59	9.14	-6.55	-18.95	-3.86	-2.64	-10.91	-3.18	-.97	-12.76	-15.69
6	112	2.22	4.27	1.66	2.03	2.66/	17.03	-15.16	-25.84	-8.63	-10.66	-19.22	-13.05	-9.30	-19.87	-16.77
7	113	2.33	4.41	1.59	2.25	2.62	1.49/	1.67	-18.87	9.47	4.54	-3.11	2.11	4.82	-3.66	-4.09
8	114	2.14	4.73	1.58	2.21	2.29	1.48	1.63/	-9.44	14.01	15.50	7.41	13.73	15.57	7.99	9.43
9	118	3.71	5.82	3.35	4.29	4.86	3.37	3.53	3.24/	6.64	.34	-8.59	-6.39	-3.24	-8.79	-6.83
10	192	3.11	5.81	2.28	3.20	3.39	2.44	2.37	2.63	4.27/	7.50	-8.83	-1.10	.38	-7.88	-14.92
11	310	2.38	4.50	1.69	2.35	2.58	1.68	1.82	1.69	3.80	2.65/	-2.19	6.11	8.51	1.25	-.37
12	320	2.22	4.70	1.62	2.20	2.78	1.62	1.62	1.74	3.81	2.52	1.74/	4.91	2.19	-6.06	-3.23
13	330	2.08	4.60	1.69	2.29	2.60	1.44	1.27	1.50	3.59	2.37	1.80	1.52/	7.13	-8.67	-7.93
14	340	2.31	4.41	2.10	2.52	2.40	2.09	2.09	1.92	3.83	3.01	2.21	2.03	2.03/	-1.88	-1.95
15	20	3.83	7.92	3.09	4.13	4.67	3.37	3.33	3.15	6.07	4.75	3.45	3.20	3.10	3.35/	-4.15
16	22	3.64	6.68	2.61	3.42	3.57	2.54	2.68	2.56	6.16	4.80	2.87	2.81	2.54	2.87	3.62
17	105	2.37	5.32	1.89	2.90	2.88	1.92	1.83	1.87	3.97	2.93	2.80	2.09	1.77	2.49	3.10
18	195	568.53	406.13	385.63	356.50	542.19	362.17	279.38	396.82	368.42	399.68	699.82	379.75	236.38	370.31	229.05
19	196	69.71	84.96	49.36	70.59	71.88	55.40	61.72	55.16	59.10	76.75	66.90	77.71	66.80	44.91	48.96
20	27	3.09	6.98	2.76	3.30	3.11	2.57	2.46	2.39	5.07	3.55	2.76	2.70	2.41	2.68	4.31
21	128	7.33	15.06	4.40	5.66	6.25	4.39	4.78	4.45	9.35	5.87	4.80	4.90	4.72	6.02	6.99
22	641	7.10	14.78	4.51	5.46	5.30	5.33	5.13	5.78	8.49	5.41	4.86	4.79	5.35	6.21	7.32
23	125	7.82	17.37	4.56	6.17	6.64	4.59	5.37	5.39	10.51	6.62	5.77	3.62	3.72	4.94	7.25
24	10068	34.17	50.49	22.78	28.67	39.75	20.63	51.03	28.78	390.91	34.53	24.10	20.11	15.47	18.73	0.00
25	30121	35.46	38.55	11.87	18.92	25.76	13.32	19.03	20.66	59.19	21.37	10.94	13.27	13.00	16.68	0.00
26	30122	116.05	336.75	20.77	20.69	136.86	10.92	128.03	129.52	385.74	122.94	11.49	10.86	9.13	13.22	0.00
27	30130	100.24	150.00	13.61	21.61	80.82	7.73	61.75	47.12	153.44	48.61	9.65	7.31	5.68	11.08	0.00
28	30188	21.88	53.34	13.47	13.43	23.06	11.74	37.74	18.06	89.79	25.12	10.08	9.14	8.13	10.80	0.00
29	30280	256.27	51.18	15.03	12.44	33.25	12.13	29.76	26.95	447.09	31.98	10.81	10.88	10.91	14.94	0.00
30	30800	50.82	46.33	22.90	32.45	33.32	16.28	34.64	32.44	229.31	27.51	19.39	14.04	15.03	20.34	0.00
31	20284	101.96	146.47	14.39	20.29	68.23	7.80	50.82	43.30	154.33	49.37	10.38	8.09	6.04	10.61	0.00
32	30939	0.00	0.00	27.24	21.58	0.00	55.44	0.00	0.00	0.00	0.00	28.99	24.70	28.56	116.11	0.00
33	30120	0.00	0.00	0.00	0.00	0.00	20.12	0.00	0.00	0.00	0.00	6.83	30.32	30.99	453.63	0.00
34	30123	287.39	339.35	23.68	24.07	233.75	15.94	206.74	259.37	555.72	275.58	21.54	13.05	14.29	13.78	0.00
35	127	39.97	36.89	15.49	23.96	20.03	15.24	28.81	15.20	163.32	16.86	21.93	65.76	70.36	30.06	0.00
36	107	10.63	20.55	6.96	9.15	10.97	6.33	6.95	7.84	17.22	8.14	6.13	8.08	6.78	9.58	18.75
37	110	13.28	22.97	6.99	9.25	10.40	8.26	7.79	8.73	20.86	9.57	7.50	10.95	7.95	11.13	19.03
38	31061	564.45	1023.78	972.38	1679.79	978.54	799.97	709.07	524.84	724.27	496.55	492.76	0.00	613.25	683.35	0.00
39	31039	134.80	132.99	74.97	91.14	80.16	78.92	79.84	83.77	178.39	77.55	74.83	86.73	72.96	72.02	0.00
40	31314	133.62	138.61	71.82	123.37	95.42	58.70	70.30	75.99	208.82	57.07	71.74	54.99	65.86	89.37	0.00

FIGURE C-2A

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.85	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	58.87	-7.91	.10	-25.30	35.00	21.31	-33.62	13.79
1	8	-3.65	3.81	1269.70	21.34	-17.05	-13.75	-7.61	-17.87	-46.55	126.93	-21.97	-120.18	92.79	114.33	5.83
2	19	2.16	5.21	1164.13	20.02	-13.88	-17.03	-11.85	-9.85	-65.15	52.60	-445.57	-92.66	145.12	86.77	-3.29
3	21	-2.91	6.25	459.64	-54.08	-9.77	9.82	3.98	.70	1.23	60.92	36.03	15.32	48.71	59.82	13.38
4	23	1.82	7.53	1317.79	-29.26	-6.81	2.77	-2.10	-.06	-34.37	58.92	9.75	14.76	69.03	37.20	-47.14
5	24	-12.83	-6.07	867.43	-288.89	-9.61	4.72	6.80	-1.29	-171.34	-19.49	-461.72	-8.56	53.67	-28.72	-92.41
6	112	-14.14	-8.08	853.88	-40.21	-25.11	-14.89	-14.65	-27.01	-26.70	-30.15	-48.13	-49.63	-13.53	-22.36	-61.27
7	113	-.45	7.93	1234.50	-50.38	-11.53	2.04	.13	-4.35	-171.57	6.60	-625.09	-123.00	28.54	70.56	-39.68
8	114	10.42	16.97	840.56	-83.46	5.09	18.27	19.66	11.75	-134.37	18.79	-184.59	1.39	52.97	26.04	-60.35
9	118	2.51	2.89	939.54	-63.11	-18.66	7.37	.07	-6.59	-889.64	39.53	-183.64	-113.65	53.84	*******	427.05
10	192	-5.45	1.91	1399.10	-18.14	-16.11	-.38	-12.85	-7.83	-59.46	79.15	-473.72	-3.24	135.57	110.54	-.62
11	310	1.81	10.20	1041.87	-100.92	-2.30	14.61	14.69	7.62	58.75	71.81	55.60	49.71	76.93	96.51	38.12
12	320	-2.59	4.51	1370.46	-52.24	-13.49	-.76	-2.28	-9.69	8.29	26.61	-.98	-1.40	19.92	26.11	-.86
13	330	-4.54	2.95	1141.96	-48.49	-17.02	-7.02	-6.18	-18.78	10.58	6.57	-17.93	-28.03	10.59	9.25	-35.08
14	340	1.44	8.19	395.24	-133.73	-3.86	1.38	8.85	2.59	.24	16.63	-14.82	-.12	25.88	18.47	-13.12
15	20	.75	10.91	455.49	-62.99	-3.95	7.41	17.15	-3.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	-1.64	7.19	860.29	46.28	-2.76	5.12	7.51	-.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	2.58/	-9.05	545.40	45.22	-10.04	-2.94	-2.37	-11.40	-63.09	86.01	-205.06	-92.15	95.03	142.38	2.12
18	195	478.20	306.74/	431.87	-297.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	65.85	79.65	521.36/	-58.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	3.90	3.91	0.00	0.00/	-7.29	8.44	9.98	4.34	-150.06	-15.60	22.95	53.40	44.52	-2.53	-92.79
21	128	5.35	5.47	0.00	0.00	5.85/	-8.86	-.71	-10.96	-132.68	28.09	-267.58	-21.04	19.68	102.65	-44.57
22	641	6.89	5.72	0.00	0.00	5.57	6.76/	-6.91	-7.73	-129.94	51.41	-541.49	-42.37	-259.06	108.97	-33.31
23	125	5.97	5.61	0.00	0.00	5.99	7.57	8.13/	-5.34	24.06	47.64	6.70	1.27	40.77	32.46	11.36
24	10068	0.00	30.22	0.00	0.00	32.21	38.52	50.53	15.47/	-16.67	21.32	-36.18	-38.35	19.55	1.40	-31.20
25	30121	0.00	10.95	0.00	0.00	27.88	23.28	25.26	14.56	24.21/	-33.59	-19.37	-25.81	-1.24	-7.04	-45.44
26	30122	0.00	130.84	0.00	0.00	228.60	253.97	398.56	10.55	12.45	14.15/	-5.98	-6.60	32.46	17.62	-13.25
27	30130	0.00	57.49	0.00	0.00	58.91	93.54	44.93	7.09	13.56	11.42	9.39/	-2.53	36.77	25.36	-11.38
28	30188	0.00	16.63	0.00	0.00	25.09	29.54	465.08	11.13	15.98	12.66	8.09	7.59/	-33.55	-16.17	-51.36
29	30280	0.60	24.32	0.00	0.00	26.02	40.22	15.49	10.81	20.78	10.83	10.15	10.98	11.91/	-25.56	-50.57
30	30800	0.00	30.62	0.00	0.00	37.70	33.46	39.84	17.41	19.91	17.63	16.63	17.95	16.46	14.90/	-15.92
31	20284	0.00	62.31	0.00	0.00	82.88	80.38	65.60	5.68	14.17	9.96	10.15	4.60	6.76	11.63	15.70
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.35	157.22	132.79	251.25	212.41	28.98	102.74	149.91
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.83	360.90	436.91	275.69	215.77	31.11	325.11	392.85
34	30123	0.00	233.03	0.00	0.00	341.06	318.79	487.22	16.06	17.37	13.73	13.27	14.09	12.38	15.61	18.45
35	127	0.00	21.65	0.00	0.00	21.40	23.02	29.34	29.35	31.31	15.05	173.29	54.58	23.12	34.60	32.24
36	107	15.73	7.51	0.00	0.00	8.44	7.97	14.73	10.12	33.65	14.38	188.03	33.90	21.74	32.40	32.14
37	116	26.72	6.58	0.00	0.00	9.32	9.26	13.73	11.74	50.99	27.45	247.38	111.58	34.21	81.34	34.83
38	31061	0.00	758.18	0.00	0.00	364.25	962.44	0.00	782.67	755.15	280.59	436.19	661.36	898.62	0.00	784.96
39	31039	0.00	99.76	0.00	0.00	102.84	107.17	112.24	76.59	301.39	203.23	268.38	79.54	283.87	320.49	136.19
40	31314	0.00	74.49	0.00	0.00	84.07	107.01	103.77	80.69	234.91	198.96	165.50	61.15	229.77	198.02	137.91

FIGURE C-2B

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	-34.00	0.00	0.00	-13.27	33.66	-20.51	-26.81	2133.42	-156.14	-256.07
2	19	-75.68	0.00	0.00	-588.10	31.53	-22.44	-27.50	7429.07	-143.81	-391.63
3	21	20.13	36.98	0.00	72.41	24.42	6.76	1.46	2447.14	-121.02	-162.47
4	23	26.40	100.67	0.00	72.77	-38.78	1.24	-8.36	1694.87	-147.77	-277.08
5	24	40.34	0.00	0.00	-776.97	-49.23	-16.99	-20.96	916.42	-86.65	-155.37
6	112	-56.92	-23.74	-16.72	-10.62	-34.47	-32.05	-35.11	1080.26	-137.39	-243.38
7	113	-109.86	0.00	0.00	-673.95	-25.35	-7.54	-13.18	1019.66	-213.16	-325.74
8	114	15.35	0.00	0.00	-146.61	-17.87	.64	-1.33	1616.99	-143.04	-148.34
9	118	-65.30	0.00	0.00	60.56	-103.10	3.89	-15.17	1118.66	-58.74	-426.65
10	192	21.95	0.00	0.00	-435.68	40.72	5.22	-15.08	1543.19	-89.38	-177.85
11	310	45.29	55.50	43.42	99.23	22.73	-7.04	-13.84	1181.68	-88.87	-216.36
12	320	4.66	12.88	-4.48	33.00	-80.39	5.54	-12.67	0.00	-83.64	-219.63
13	330	-27.84	1.33	-11.82	25.13	-123.63	-15.57	-24.96	1238.60	-172.90	-273.77
14	340	-1.21	-168.79	-163.93	39.07	-32.78	-34.35	-35.62	981.61	140.26	-3.07
15	20	0.00	0.00	0.00	0.00	0.00	-11.61	-40.96	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	-37.08	-25.18	0.00	0.00	0.00
17	105	-95.29	0.00	0.00	-175.08	31.87	-8.06	-11.87	1303.18	-179.31	-291.72
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	33.32	0.00	0.00	274.78	-49.89	-13.45	-22.67	3254.45	-53.05	-193.45
21	128	14.42	0.00	0.00	123.82	-18.14	-5.65	-12.16	4243.12	-91.77	-265.54
22	641	-39.80	0.00	0.00	-576.12	30.24	-19.97	-14.55	0.00	-188.08	-223.20
23	125	8.48	-.94	-7.66	56.28	43.60	9.31	-3.62	2297.71	10.29	-169.72
24	10068	-37.03	-499.57	219.60	28.10	125.80	83.28	74.68	1156.95	956.56	1014.48
25	30121	-23.39	26.73	29.22	7.89	-36.10	-70.55	-81.45	2211.40	122.85	-84.57
26	30122	-2.85	304.60	154.89	41.22	274.14	417.87	815.72	1760.00	426.10	416.56
27	30130	-2.56	336.40	156.02	40.13	-80.21	-51.12	126.44	936.79	-111.98	-164.12
28	30188	-35.22	-3.68	-15.62	13.93	-62.99	-52.19	-53.71	-262.29	60.12	262.91
29	30280	-25.27	20.26	366.04	22.11	-58.51	-168.78	-147.96	0.00	1101.67	163.93
30	30800	16.38	-166.59	398.90	51.08	52.68	13.54	3.31	1651.49	-111.00	-659.92
31	20284	/ 3.39	219.92	1.71	37.86	-68.94	-15.78	117.98	748.41	-73.74	-186.70
32	30939	199.37	/ 11.47	-18.72	52.44	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	243.07	49.79	/ 15.68	-192.39	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	14.01	209.70	513.11	/ 40.09	195.48	685.58	1154.33	0.00	537.26	90.69
35	127	54.95	0.00	0.00	233.71	/ 6.27	-29.14	-44.00	1256.72	-53.42	-90.57
36	107	48.77	0.00	0.00	218.83	14.24	/ 3.81	-7.50	771.89	-21.35	-197.72
37	116	95.18	0.00	0.00	329.94	23.70	8.68	/ 10.88	1159.13	-326.37	-295.89
38	31061	432.83	0.00	0.00	0.00	423.33	563.74	944.13	2712.58	*******	0.00
39	31039	62.78	0.00	0.30	280.58	80.78	71.62	105.33	1169.70	/ 89.37	-120.43
40	31314	70.16	0.00	0.00	326.80	72.38	81.08	147.05	0.00	94.69	/ 187.03

FIGURE C-2C

DOPPLER NAVSAT SOLUTION NSWC828907

HEIGHT RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-166.75	-149.83	-68.76	-97.73	-68.81	-93.08	-119.07	-158.80	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	6.96	-1.00	3.06	19.56	20.92	.17	5.45	-21.63	-26.29	-6.52	7.08	-16.07	-3.78	18.63	10.03
2	19	4.58/	9.17	3.51	16.27	23.16	-4.11	5.33	-21.49	-26.63	-4.82	8.49	-14.88	.02	15.54	18.11
3	21	2.48	4.63/	12.03	16.98	14.37	-4.84	.24	-25.82	-34.25	-9.86	2.20	-28.48	-11.33	14.47	4.58
4	23	3.04	5.00	2.56/	28.95	-.43	-20.12	-16.00	-40.35	-44.32	-25.06	-14.53	-37.90	-27.13	-1.00	-4.24
5	24	3.42	4.97	3.20	3.56/	28.91	-20.72	-15.96	-39.89	-51.17	-25.60	-14.81	-39.38	-27.21	-2.47	-4.97
6	112	2.25	4.41	1.96	2.26	2.73/	7.15	5.22	-28.44	-26.24	-4.15	7.36	-15.76	-6.10	18.89	14.39
7	113	2.44	4.80	1.80	2.34	3.31	2.06/	12.25	-25.49	-29.24	-8.25	3.51	-20.69	-11.65	14.08	6.88
8	114	2.48	4.63	1.73	2.43	3.22	1.88	1.88/	13.59	-5.79	16.90	28.12	4.22	17.05	40.34	30.91
9	118	4.44	5.78	3.96	4.46	5.78	4.17	4.02	3.77/	29.85	20.83	36.07	7.63	23.14	43.59	23.23
10	192	3.53	5.81	2.97	3.45	4.26	3.07	2.64	2.54	4.48/	3.73	11.75	-11.29	.48	24.71	16.71
11	310	2.44	4.95	1.84	2.75	3.71	2.22	1.78	1.93	4.12	2.91/	13.29	-23.07	-13.25	11.78	2.23
12	320	2.61	4.63	1.84	2.80	3.51	2.07	2.02	2.02	3.80	3.33	1.95/	8.63	7.85	34.44	25.32
13	330	2.86	5.01	2.50	3.06	3.63	2.58	2.19	2.42	4.34	3.39	2.28	2.73/	.89	25.69	22.11
14	340	2.58	4.53	2.28	2.06	3.58	2.07	1.95	2.22	3.99	3.08	2.14	2.51	2.57/	26.11	-4.92
15	20	4.77	8.60	3.68	4.46	5.51	3.29	3.36	4.16	7.47	6.01	4.06	4.09	4.43	4.06/	19.85
16	22	4.24	8.25	3.73	3.51	5.04	3.13	3.07	4.00	7.95	5.52	3.97	3.83	4.46	4.20	4.01
17	105	2.62	5.19	1.98	3.17	3.42	1.83	2.17	2.36	4.53	3.64	1.93	2.04	2.77	2.27	3.86
18	135	600.33	518.36	503.71	480.44	636.97	404.41	543.55	526.70	463.68	419.00	767.85	419.81	650.93	520.43	619.63
19	136	95.23	130.02	100.01	97.04	121.12	83.09	98.27	102.60	91.75	97.62	84.01	98.98	93.61	100.83	100.51
20	27	3.39	7.45	2.80	3.04	4.19	3.02	2.50	2.83	5.15	4.17	2.99	3.61	3.36	2.67	4.86
21	128	7.48	16.50	5.11	6.93	8.24	5.84	5.56	5.41	10.92	7.49	5.57	5.64	6.78	5.99	8.22
22	641	6.53	15.70	3.99	5.44	6.61	4.92	4.37	5.44	8.99	6.30	3.92	3.88	5.76	5.17	8.89
23	125	9.04	18.91	6.48	7.94	9.72	6.24	6.71	5.77	11.61	7.78	6.93	5.13	6.26	5.97	10.32
24	10068	32.95	42.49	17.97	22.14	38.99	11.72	41.48	33.58	449.54	37.57	16.14	15.03	13.04	12.14	0.00
25	30121	45.35	42.62	22.27	25.93	43.39	16.31	21.09	19.77	66.62	25.45	14.45	18.75	17.48	10.95	0.00
26	30122	265.34	372.18	26.03	30.95	285.74	9.99	222.38	178.44	412.27	214.12	17.70	16.34	8.72	12.21	0.00
27	30130	145.60	174.12	29.73	28.79	150.72	18.25	68.53	55.16	184.36	75.35	16.78	15.78	19.45	10.35	0.00
28	30186	37.08	56.92	20.65	22.56	62.09	15.75	40.18	32.46	122.02	39.02	18.78	13.60	16.56	10.40	0.00
29	30280	288.31	75.00	26.30	21.00	64.77	17.19	21.72	34.81	503.07	37.04	14.02	23.92	19.75	11.51	0.00
30	30800	46.44	48.49	26.35	21.20	39.50	16.25	29.27	19.23	220.04	23.19	18.56	20.24	19.81	14.26	0.00
31	20284	123.34	176.52	20.60	27.72	142.05	8.74	57.31	53.92	167.90	57.58	8.99	9.63	11.48	8.76	0.00
32	30939	0.00	0.00	28.56	42.59	0.00	22.30	0.08	0.00	0.00	0.00	42.79	53.05	44.93	119.69	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	31.55	0.00	0.00	0.00	0.00	17.79	41.59	22.43	246.62	0.00
34	30123	334.24	626.04	27.84	58.92	521.07	16.53	230.42	309.20	532.03	355.96	22.82	19.41	18.26	13.01	0.00
35	127	40.06	49.35	16.96	24.65	40.54	20.07	23.01	11.38	173.28	17.80	22.19	92.21	59.91	27.89	0.00
36	107	11.67	19.95	7.74	10.95	13.20	9.22	8.26	7.39	25.57	11.22	6.72	10.43	9.93	9.99	28.53
37	116	12.94	21.20	7.82	11.38	14.44	10.02	9.92	10.18	26.78	14.22	8.86	11.69	11.29	10.40	20.75
38	31061	500.92	1024.14	770.39	899.72	1314.78	613.30	752.89	482.43	160.38	1299.04	1007.53	0.00	405.96	665.85	0.00
39	31039	158.80	200.78	113.23	94.76	148.58	88.64	122.89	94.97	210.50	82.61	89.64	107.23	89.08	111.22	0.00
40	31314	141.98	197.08	92.06	104.32	150.33	67.25	72.37	94.93	245.02	87.86	85.99	87.25	61.55	65.09	0.00

FIGURE C-3A

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	21.19	7.12	533.08	2.64	11.82	-40.77	7.98	24.11	42.32	14.87	-165.50	542.35	42.39	610.99	18.83
2	19	15.41	8.91	447.64	128.76	5.30	-35.63	2.90	-7.93	155.43	121.60	64.30	353.80	65.67	220.78	127.72
3	21	13.43	2.47	875.48	168.86	2.63	-48.36	-.52	15.81	-25.89	20.82	-48.53	13.06	-4.19	11.09	-13.88
4	23	.33	-16.00	1558.46	238.15	-14.32	-70.62	-32.26	-14.00	-30.85	12.65	-27.20	13.56	-22.32	33.31	-9.38
5	24	-.49	-21.03	1010.60	-124.69	-1.18	-68.03	-14.21	-10.41	-33.95	-3.74	364.86	527.73	-66.85	-50.03	-46.65
6	112	17.73	6.41	873.80	138.12	8.19	-47.18	-.05	9.21	27.76	47.66	19.38	56.98	32.50	38.47	16.04
7	113	16.15	3.95	974.43	173.71	1.59	-43.74	-2.28	19.27	-76.96	-15.41	-662.86	280.80	111.86	-80.25	-90.36
8	114	37.07	27.52	719.00	92.16	29.20	-20.52	28.84	39.38	-31.67	-24.41	-646.41	262.26	-10.74	-35.52	-68.45
9	118	24.78	35.68	778.11	158.07	30.63	-20.16	51.18	59.21	77.49	16.74	-31.94	157.82	117.59	489.56	29.39
10	192	25.90	14.01	1226.83	154.20	14.66	-37.58	11.15	18.62	-8.50	-23.38	-759.46	238.23	-32.18	-47.75	-53.54
11	310	11.06	3.33	1059.68	176.24	.73	-29.13	7.97	16.33	-22.02	16.40	-25.41	6.41	8.89	-15.92	-26.93
12	320	31.15	22.74	965.51	103.96	23.64	-38.97	7.14	24.67	-20.22	40.21	-2.76	30.46	4.50	18.40	40.60
13	330	31.84	15.94	793.83	109.07	18.74	-12.21	20.26	46.34	-42.80	-1.97	-49.43	.17	-28.12	-25.70	6.90
14	340	3.52	-9.28	1785.11	292.43	-13.78	-62.06	-19.98	-9.75	-35.86	4.46	-25.90	-11.18	-41.33	-7.98	2.33
15	20	6.00	-3.74	967.68	180.77	-9.26	-71.07	-11.07	-4.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	-26.25	-11.36	1678.45	166.27	-16.45	-82.57	-32.91	-16.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	3.74/	-14.84	1125.59	120.96	.51	-42.99	-.05	.07	20.06	19.28	-101.88	426.75	22.09	-13.82	-21.51
18	195	519.55	436.67/	-296.58	68.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	140.88	123.04	1055.53/	-153.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	4.71	4.07	0.00	0.00/	-14.12	-45.55	-10.26	12.88	-18.58	-24.17	-881.18	364.54	-8.26	-51.35	-63.04
21	128	7.34	5.50	0.00	0.00	6.43/	-31.37	53.16	51.69	-64.43	-43.81	-322.58	471.13	-27.87	-98.28	-81.25
22	641	7.99	4.68	0.00	0.00	5.08	6.37/	-7.59	23.90	-48.97	-16.33	339.68	376.18	892.58	-42.15	-109.40
23	125	9.29	7.02	0.00	0.00	7.46	8.22	7.75/	-21.37	-19.15	23.66	-17.84	6.62	-6.45	9.15	9.71
24	10068	0.00	21.55	0.00	0.00	30.59	26.66	37.26	12.35/	-7.04	43.37	10.60	4.08	4.37	24.44	27.80
25	30121	0.00	20.56	0.00	0.00	18.76	25.01	26.56	9.69	14.96/	-35.20	-36.49	-25.37	-31.08	-20.23	-.59
26	30122	0.00	184.57	0.00	0.00	297.29	201.04	682.83	12.48	10.27	13.38/	-2.01	-2.51	8.85	14.16	40.83
27	30130	0.00	57.76	0.00	0.00	83.51	90.37	60.36	11.62	12.67	10.45	13.53/	-29.40	2.67	17.03	32.01
28	30188	0.00	27.58	0.00	0.00	27.20	33.07	443.08	10.96	13.20	13.34	15.20	10.80/	-7.52	26.69	31.79
29	30280	0.00	35.90	0.00	0.00	21.26	30.40	31.93	12.83	13.61	12.65	12.37	10.84	15.95/	-18.55	-5.40
30	30800	0.00	22.28	0.00	0.00	23.58	31.27	37.80	13.82	19.25	14.60	16.78	13.90	17.97	18.27/	-25.35
31	20284	0.00	41.95	0.00	0.00	76.40	78.68	88.94	8.28	11.81	10.58	11.08	10.28	12.19	11.69	13.12
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.61	106.57	116.90	143.75	172.49	37.10	104.62	153.30
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.90	272.85	270.74	227.74	208.65	39.01	189.27	467.49
34	30123	0.00	260.45	0.00	0.00	271.35	286.96	269.98	14.53	13.46	11.05	14.93	18.86	16.59	13.07	20.65
35	127	0.00	19.09	0.00	0.00	20.28	28.15	31.06	21.83	31.43	20.48	195.99	62.90	29.13	32.31	19.82
36	107	24.73	8.06	0.00	0.00	8.68	8.73	12.83	11.97	33.92	14.61	310.59	74.18	34.08	24.55	24.08
37	116	28.40	8.44	0.00	0.00	8.73	9.93	10.99	13.76	48.14	36.72	351.63	158.35	54.76	43.02	39.20
38	31061	0.00	531.11	0.00	0.00	1052.43	729.48	0.00	564.33	428.91	733.48	193.26	588.35	809.14	0.00	870.91
39	31039	0.00	92.40	0.00	0.00	125.80	130.27	143.66	92.50	298.17	359.21	326.18	90.45	345.17	429.28	130.19
40	31314	0.00	68.99	0.00	0.00	89.29	100.80	112.54	93.01	210.99	245.40	257.68	66.89	253.90	340.34	101.97

FIGURE C-3B

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT RATE CM/YR

VALUES ON AND ABOVE DIAGONAL ARE RATES. VALUES BELOW DIAGONAL ARE STANDARD ERRORS OF RATES

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	224.23	0.00	0.00	-273.01	86.21	5.71	21.57	2377.29	214.66	363.19
2	19	43.07	0.00	0.00	-192.55	168.16	29.21	33.50	3295.30	110.16	31.20
3	21	-3.20	-65.99	0.00	101.88	-16.71	.23	8.32	*******	-53.12	179.58
4	23	-4.75	-67.79	0.00	60.03	2.25	-8.87	-10.49	1101.60	-168.10	-141.51
5	24	157.28	0.00	0.00	805.71	14.10	-7.13	-8.01	*******	214.89	303.98
6	112	48.01	-65.17	-32.35	83.02	51.73	6.85	4.09	46.55	141.16	246.02
7	113	-163.07	0.00	0.00	-938.12	-16.55	4.35	11.00	2211.79	-31.64	30.80
8	114	-160.58	0.00	0.00	-916.78	.93	14.80	24.09	1440.39	-120.04	18.57
9	118	-199.95	0.00	0.00	770.17	-63.34	43.10	44.00	1025.46	-104.67	52.14
10	192	-162.35	0.00	0.00	*******	14.68	17.38	18.17	1220.29	-129.56	22.68
11	310	-4.05	-79.00	-30.53	22.62	47.15	33.46	35.57	1586.63	-26.47	84.20
12	320	25.79	-66.21	-33.60	56.68	255.23	20.29	29.90	0.00	179.27	357.43
13	330	1.60	-36.05	-.32	28.63	591.73	72.96	67.49	808.05	453.89	691.69
14	340	-5.38	42.26	354.51	27.50	11.90	16.64	3.93	1426.66	-61.75	28.87
15	20	0.00	0.00	0.00	0.00	0.00	-14.18	-5.33	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	-45.77	-51.47	0.00	0.00	0.00
17	105	14.92	0.00	0.00	-274.35	42.76	11.33	16.09	1032.26	143.37	205.83
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	-56.08	0.00	0.00	-944.67	7.61	14.36	16.07	2411.64	22.01	31.95
21	128	11.70	0.00	0.00	-414.76	-2.33	16.40	20.83	1235.27	100.35	281.50
22	641	-28.64	0.00	0.00	-189.99	-5.61	-5.71	13.31	0.00	30.02	110.51
23	125	10.00	-79.47	-41.61	55.62	5.85	-.49	18.14	1202.20	-61.92	70.36
24	10068	39.63	36.88	490.81	68.93	29.89	-8.19	24.84	301.91	162.59	968.06
25	30121	-2.35	-184.97	-162.91	15.71	48.72	18.45	11.60	586.95	-585.63	-30.20
26	30122	27.20	81.07	147.02	49.73	856.70	325.52	278.15	-306.16	190.76	867.34
27	30130	9.33	-.47	38.08	65.30	-269.25	-219.31	-218.44	2344.78	-408.33	-277.25
28	30188	37.84	-99.54	-59.88	63.14	62.06	-14.93	27.49	2880.20	-650.94	-178.80
29	30280	14.21	2.95	220.43	37.49	53.73	48.51	14.24	0.00	*******	-87.27
30	30800	-11.70	-503.54	-481.63	28.10	77.63	41.22	54.16	-75.83	32.80	-157.77
31	20284	/32.34	-161.09	-130.64	31.83	119.38	181.15	4.24	1463.79	70.95	122.40
32	30939	199.92	/-63.16	35.42	-64.36	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	233.65	32.71	/-29.41	155.08	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	14.14	98.22	442.47	/66.43	866.59	653.01	236.40	0.00	274.68	1000.92
35	127	49.69	0.00	0.00	297.42	/93.46	-30.58	-7.91	-539.28	-107.51	19.98
36	107	70.36	0.00	0.00	284.88	19.06	/16.03	3.21	2034.46	-30.90	11.75
37	116	157.45	0.00	0.00	460.00	36.10	9.99	/21.75	304.58	-173.81	85.70
38	31061	626.56	0.00	0.00	0.00	1181.14	582.01	2296.59	/917.48	*******	0.00
39	31039	98.11	0.00	0.00	507.66	91.37	90.13	170.06	1124.44	/151.08	122.11
40	31314	59.76	0.00	0.00	347.50	77.89	115.96	172.32	0.00	127.54	/253.40

FIGURE C-3C

APPENDIX D

RESIDUALS OF FIT

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.

VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	--1.17	1.99	1.29	1.43	1.68	1.19	1.27	1.24	1.44	1.66	1.53	1.34	1.33	1.34	1.22
2	19	1.99/	--1.52	1.78	1.98	2.09	1.52	1.70	1.69	1.79	1.84	1.85	1.75	1.73	1.77	1.44
3	21	1.28	1.78/	---.68	1.16	1.43	.78	.85	.96	1.16	1.23	1.02	.98	.97	1.22	.96
4	23	1.40	1.97	1.12/	--1.04	1.43	1.12	1.13	1.14	1.45	1.40	1.31	1.21	1.12	1.13	1.02
5	24	1.63	1.98	1.32	1.42/	--1.36	1.28	1.46	1.46	1.59	1.56	1.48	1.35	1.43	1.39	1.41
6	112	1.18	1.50	.76	1.11	1.22/	---.62	.75	.83	1.25	1.17	.94	.91	.75	1.04	.96
7	113	1.27	1.70	.85	1.08	1.34	.72/	---.60	.78	1.16	1.18	.97	.92	.76	1.10	.94
8	114	1.24	1.68	.94	1.13	1.41	.83	.77/	---.63	1.18	1.18	1.12	.92	.76	1.07	.90
9	118	1.33	1.76	1.13	1.31	1.35	1.13	1.11	1.07/	---.93	1.38	1.37	1.39	1.21	1.41	.99
10	192	1.66	1.82	1.22	1.40	1.53	1.17	1.16	1.18	1.30/	--1.04	1.25	1.16	1.16	1.39	1.36
11	310	1.53	1.83	1.01	1.30	1.43	.94	.96	1.12	1.29	1.24/	---.85	1.02	.99	1.32	1.23
12	320	1.32	1.73	.92	1.21	1.32	.90	.85	.90	1.21	1.16	1.00/	---.77	.87	1.10	1.02
13	330	1.32	1.71	.92	1.12	1.40	.75	.71	.76	1.07	1.16	.99	.87/	---.68	1.05	.85
14	340	1.30	1.70	1.13	1.13	1.39	1.01	1.01	1.04	1.20	1.38	1.29	1.09	1.04/	--1.07	.92
15	20	1.21	1.41	.93	1.01	1.36	.96	.92	.90	.96	1.34	1.23	1.01	.84	.91/	--1.01
16	22	1.07	1.28	1.01	1.14	1.44	.80	.93	.85	.92	1.24	1.22	.90	.97	.89	.86
17	105	1.33	1.62	.89	1.14	1.32	.75	.75	.74	1.22	1.14	.95	.84	.73	.96	1.03
18	195	.57	.80	.60	.72	.81	.82	.62	.75	.66	1.15	.95	.73	.88	.91	.50
19	196	2.04	2.39	2.11	2.31	2.92	1.96	2.00	2.21	2.21	2.38	1.94	1.64	2.00	2.08	2.03
20	27	1.44	1.96	1.08	1.28	1.38	1.11	1.09	1.07	1.26	1.24	1.20	1.10	1.12	1.32	1.35
21	128	1.61	1.88	1.13	1.41	1.59	1.02	1.00	1.08	1.57	1.34	1.16	1.22	1.03	1.34	1.37
22	641	1.58	2.07	.98	1.29	1.52	1.07	1.08	1.07	1.24	1.31	1.23	1.15	1.15	1.20	.91
23	125	1.58	1.94	1.22	1.37	1.51	1.03	1.18	.94	1.71	1.35	1.32	1.03	.98	1.28	1.46
24	10068	1.30	2.18	.96	1.27	1.47	1.02	1.03	1.01	1.02	.99	.94	.87	1.03	1.14	0.00
25	30121	1.27	1.56	1.43	1.29	.99	.99	1.04	1.00	1.26	.89	1.13	.83	1.05	1.38	0.00
26	30122	1.16	1.91	1.11	1.45	1.08	.68	1.07	.98	1.18	.88	1.17	.83	.84	1.02	0.00
27	30130	1.20	1.52	.56	1.06	1.12	.72	.80	.75	1.07	1.08	.62	.66	.75	1.01	0.00
28	30188	1.26	1.74	.88	.89	1.35	.71	1.23	.99	1.20	1.17	.86	.87	.90	.89	0.00
29	30280	1.20	1.99	.86	1.21	1.24	.73	.93	.79	.89	.80	.68	.85	.81	1.07	0.00
30	30800	1.12	2.13	1.42	1.32	1.32	1.12	1.62	1.42	1.47	1.57	1.58	1.26	1.55	1.39	0.00
31	20284	1.16	1.76	.61	1.10	1.26	.74	.88	.74	1.01	1.13	.70	.69	.74	1.08	0.00
32	30939	0.00	0.00	.45	1.04	0.00	.67	0.00	0.00	0.00	0.00	.44	.73	.67	.85	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	.67	.86	.97	1.17	0.00
34	30123	1.39	2.11	1.28	1.19	1.65	1.07	1.31	1.05	1.15	1.03	1.06	1.09	1.12	1.32	0.00
35	127	1.17	1.90	.86	1.13	1.18	.82	.96	.86	1.28	.89	.92	1.02	.92	1.07	0.00
36	107	1.51	1.81	.91	1.42	1.50	.95	.97	.93	1.64	1.28	.96	1.10	1.00	1.36	1.67
37	116	1.65	1.95	1.15	1.37	1.53	1.07	1.15	1.23	1.86	1.54	1.21	1.30	1.24	1.41	1.61
38	31061	.51	1.35	.40	.74	.56	.73	.50	.57	.48	.40	.58	0.00	.45	1.12	0.00
39	31639	1.58	1.86	1.52	1.15	1.57	1.36	1.18	1.06	1.54	1.62	1.32	1.61	1.43	1.60	0.00
40	31314	1.30	1.80	.82	1.32	1.18	.86	1.15	.86	1.09	1.00	.89	.96	1.11	1.21	0.00

FIGURE D-1A

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.80	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	1.07	1.33	.83	2.06	1.44	1.61	1.64	1.61	1.38	1.63	1.16	1.30	1.27	1.42	1.12
2	19	1.28	1.62	.80	2.40	1.96	1.88	2.08	2.03	2.21	1.61	1.91	1.83	1.76	1.99	2.18
3	21	1.01	.90	1.02	2.13	1.09	1.15	.98	1.33	.98	1.46	1.15	.58	.91	.86	1.42
4	23	1.20	1.15	1.23	2.32	1.29	1.41	1.36	1.46	1.27	1.54	1.45	1.07	.97	1.27	1.34
5	24	1.64	1.41	1.44	2.97	1.39	1.59	1.58	1.55	1.47	1.47	1.20	1.19	1.35	1.36	1.33
6	112	.81	.77	.94	2.00	1.11	1.03	1.13	1.14	1.10	1.06	.68	.72	.78	.73	1.22
7	113	.93	.75	.96	2.02	1.09	1.03	1.11	1.28	1.04	1.48	1.29	.81	1.26	1.19	1.65
8	114	.86	.75	1.01	2.21	1.07	1.09	1.20	1.06	1.01	1.35	1.16	.75	1.01	.90	1.46
9	118	.93	1.27	.86	2.23	1.33	1.60	1.25	2.01	1.04	1.72	1.27	1.11	1.21	.94	1.82
10	192	1.31	1.16	1.29	2.41	1.24	1.35	1.31	1.45	1.03	1.50	1.05	1.09	1.17	1.06	1.58
11	310	1.24	.97	1.21	1.99	1.21	1.17	1.23	1.35	.94	1.18	1.17	.62	.90	.71	1.59
12	320	1.00	.88	1.15	1.64	1.11	1.22	1.23	1.16	.92	.83	.83	.67	.92	.86	1.26
13	330	1.01	.75	1.16	2.00	1.13	1.04	1.19	1.15	1.03	1.12	.90	.75	.90	.87	1.62
14	340	1.06	1.01	1.13	2.08	1.36	1.34	1.34	1.40	1.18	1.38	1.02	1.02	.93	1.07	1.39
15	20	.91	1.04	1.21	2.03	1.35	1.40	.99	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/---	.82	.95	.81	2.18	1.00	1.25	1.01	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	.94/---	.52	1.03	2.41	1.06	1.07	1.19	1.11	1.02	1.20	1.00	.84	1.07	.89	1.32
18	195	.61	.49/---	.90	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	2.16	2.38	1.16/--	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.99	1.06	0.00	0.00/---	.51	1.26	1.17	1.44	1.18	1.47	1.34	1.31	.96	1.29	1.21
21	128	1.21	1.05	0.00	0.00	1.25/---	.91	1.30	1.35	1.28	1.49	1.51	1.05	1.19	1.06	1.76
22	641	.93	1.17	0.00	0.00	1.15	1.25/--	1.03	1.83	1.26	1.29	.74	1.04	1.42	1.16	1.19
23	125	1.12	1.04	0.00	0.00	1.34	1.32	1.33/--	1.00	1.34	1.03	1.07	1.10	1.12	1.10	1.49
24	10068	0.00	1.00	0.00	0.00	1.18	1.28	.95	1.17/---	.88	1.37	1.06	.98	1.12	1.14	1.54
25	30121	0.00	.82	0.00	0.00	.95	1.18	.73	1.00	1.32/---	.96	.82	.90	1.07	.99	1.61
26	30122	0.00	.86	0.00	0.00	1.13	1.29	.54	.91	1.03	.81/---	.63	.79	.96	.77	1.33
27	30130	0.00	.82	0.00	0.00	1.31	1.04	1.04	.91	.95	.90	.79/---	.59	.82	.66	1.47
28	30188	0.00	.97	0.00	0.00	.96	1.17	1.36	.93	1.11	1.07	.96	.82/---	.65	1.03	1.37
29	30280	0.00	.74	0.00	0.00	1.13	.98	1.12	1.03	1.12	.97	.75	.66	1.01/---	.69	1.65
30	30800	0.00	1.26	0.00	0.00	1.20	1.69	1.05	1.47	1.41	1.61	1.28	1.44	1.29	1.58/--	1.22
31	20284	0.00	.85	0.00	0.00	1.17	1.17	.98	.97	.84	.85	.82	.50	.80	.57	1.66
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.89	1.10	1.09	.53	.60	.79	.99	1.26
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	.56	.98	.94	.96	.86	1.35	1.30
34	30123	0.00	1.15	0.00	0.00	1.57	1.13	.92	1.23	1.36	1.27	1.33	1.07	1.03	1.25	1.53
35	127	0.00	.74	0.00	0.00	1.19	1.15	.96	1.00	1.10	.66	.87	.94	1.01	.73	1.14
36	107	1.21	.96	0.00	0.00	1.25	1.10	1.17	1.03	.93	1.05	1.02	.39	.93	.44	1.61
37	116	1.32	1.12	0.00	0.00	1.42	1.39	1.20	1.36	1.78	1.36	1.79	1.60	1.57	1.88	1.88
38	31061	0.00	.55	0.00	0.00	.62	.60	0.00	.71	.69	.69	.90	.61	1.17	0.00	.56
39	31039	0.00	1.09	0.00	0.00	1.67	1.63	2.00	1.60	1.08	1.17	1.08	1.42	1.18	1.23	1.29
40	31314	0.00	.94	0.00	0.00	1.17	1.31	.93	1.22	1.17	.87	.75	.70	1.19	.69	1.23

FIGURE D-1B

DOPPLER NAVSAT SOLUTION NSWC820907

LONGITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	1.31	0.00	0.00	1.61	1.21	1.52	1.65	1.13	1.84	1.65
2	19	2.04	0.00	0.00	2.27	1.90	1.81	1.95	1.36	2.41	2.12
3	21	.65	.55	0.00	1.28	.86	.92	1.15	.47	1.66	.97
4	23	1.11	1.36	0.00	1.33	1.20	1.43	1.37	.78	1.40	1.52
5	24	1.44	0.00	0.00	1.72	1.22	1.50	1.54	.65	1.85	1.47
6	112	.74	.71	1.40	1.10	.82	.95	1.07	.73	1.52	1.03
7	113	.90	0.00	0.00	1.34	.96	.98	1.15	.56	1.20	1.20
8	114	.74	0.00	0.00	1.07	.87	.94	1.23	.60	1.12	.91
9	118	1.01	0.00	0.00	1.17	1.33	1.64	1.86	.48	1.55	1.10
10	192	1.15	0.00	0.00	1.07	.92	1.28	1.54	.41	1.71	1.19
11	310	.70	.47	1.20	1.07	.92	.96	1.23	.76	1.40	1.04
12	320	.73	.73	1.13	1.09	1.02	1.11	1.31	0.00	1.74	1.06
13	330	.74	.67	1.22	1.14	.97	1.00	1.24	.47	1.45	1.14
14	340	1.12	.85	1.18	1.32	1.07	1.36	1.41	1.13	1.68	1.30
15	20	0.00	0.00	0.00	0.00	0.00	1.69	1.61	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	1.22	1.32	0.00	0.00	0.00
17	105	.92	0.00	0.00	1.18	.76	.97	1.12	.56	1.17	1.08
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	1.25	0.00	0.00	1.60	1.21	1.25	1.43	.82	1.76	1.42
21	128	1.17	0.00	0.00	1.13	1.16	1.11	1.41	.64	1.65	1.35
22	641	1.06	0.00	0.00	1.31	1.03	1.17	1.20	0.00	2.17	1.18
23	125	1.22	.90	1.44	1.28	1.05	1.03	1.37	.78	1.62	1.23
24	10068	.84	1.12	.67	1.38	1.10	.93	1.78	.70	1.08	1.19
25	30121	.88	1.26	1.11	1.28	1.19	1.51	1.68	.80	1.22	1.10
26	30122	.84	.53	.98	1.33	1.05	1.27	1.85	.98	1.31	1.88
27	30130	.50	.60	1.01	1.07	.94	.54	1.60	.61	1.57	.85
28	30188	.81	.81	.98	1.03	1.02	1.02	1.57	1.17	1.19	1.24
29	30280	.59	1.07	1.44	1.25	.93	.86	2.05	0.00	1.26	.69
30	30600	1.70	1.31	1.71	1.55	1.16	1.66	1.91	.66	1.63	1.79
31	20284/	.53	.71	1.00	1.11	.96	.43	1.68	.55	1.25	.87
32	30939	.70/	.78	1.15	1.32	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	.88	.96/	.95	.78	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	1.10	1.31	.77/	1.00	1.14	.86	2.39	0.00	1.00	1.26
35	127	.90	0.00	0.00	1.01/	.58	.98	1.52	.68	1.37	1.05
36	107	.42	0.00	0.00	.73	.98/	.73	1.27	.74	1.40	.83
37	116	1.67	0.00	0.00	2.37	1.50	1.27/	.98	1.70	1.78	1.35
38	31061	.55	0.00	0.00	0.00	.67	.72	1.70/	.36	.40	0.00
39	31039	1.24	0.00	0.00	.99	1.19	1.38	1.64	.30/	1.36	1.38
40	31314	.83	0.00	0.00	1.25	.91	.78	1.32	0.00	1.37/	.89

FIGURE D-1C

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.

VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.80	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	---.80	1.74	.88	1.04	1.22	.94	.96	.95	1.04	1.09	.97	.85	.83	.93	.92
2	19	1.74/	---1.51	1.58	1.74	1.78	1.53	1.59	1.71	1.70	1.80	1.57	1.58	1.62	1.56	1.43
3	21	.88	1.58/	---.51	.90	1.02	.80	.69	.75	1.03	.84	.72	.66	.72	.89	.81
4	23	1.03	1.73	.89/	---.79	1.15	.94	.91	.91	1.27	1.10	.91	.85	.91	.98	.97
5	24	1.20	1.77	1.01	1.12/	---.95	1.07	1.10	1.07	1.28	1.19	1.08	1.09	1.04	1.02	1.21
6	112	.87	1.48	.68	.78	1.03/	---.68	.79	.99	1.04	.91	.88	.75	.65	1.04	.93
7	113	.95	1.59	.69	.91	1.08	.62/	---.48	.77	1.11	.89	.77	.68	.56	.88	.89
8	114	.83	1.69	.66	.86	.90	.59	.69/	---.55	1.05	1.04	.72	.82	.78	.82	.78
9	118	1.04	1.67	1.03	1.25	1.27	1.01	1.08	.97/	---.85	1.17	1.21	1.11	1.11	1.11	.78
10	192	1.09	1.79	.83	1.09	1.19	.86	.88	.94	1.17/	---.74	.97	.88	.85	1.12	1.08
11	310	.94	1.57	.70	.91	1.02	.68	.77	.68	1.18	.94/	---.53	.71	.77	.90	.90
12	320	.85	1.58	.66	.84	1.09	.63	.67	.69	1.09	.88	.69/	---.53	.60	.81	.79
13	330	.83	1.62	.71	.89	1.04	.58	.54	.61	1.11	.85	.73	.59/	---.49	.86	.82
14	340	.91	1.55	.87	.98	.93	.84	.87	.78	1.08	1.09	.90	.78	.82/	---.73	.75
15	20	.91	1.43	.80	.97	1.12	.79	.88	.73	.77	1.00	.90	.79	.79	.74/	---.72
16	22	1.00	1.34	.78	.93	1.00	.71	.85	.72	.83	1.18	.85	.83	.75	.77	1.00
17	105	.85	1.64	.70	1.00	1.02	.70	.70	.68	1.19	.93	.73	.76	.66	.92	.79
18	195	.57	.38	.53	.49	.75	.50	.39	.53	.50	.53	.95	.51	.32	.51	.32
19	196	.82	.88	.59	.91	.89	.68	.73	.66	.70	1.02	.86	.91	.78	.54	.52
20	27	1.01	1.65	.94	1.04	1.02	.85	.86	.79	1.35	1.00	.90	.86	.79	.90	1.03
21	128	1.21	1.93	.85	1.06	1.18	.82	.92	.82	1.66	1.02	.86	.92	.91	1.18	1.20
22	641	1.10	1.90	.87	1.00	1.00	.99	1.01	1.03	1.14	.93	.88	.93	1.04	1.15	.86
23	125	1.05	1.90	.72	.97	1.01	.75	.81	.78	1.60	.94	.77	.66	.67	.87	.99
24	10068	.78	1.66	1.12	1.26	1.25	1.13	1.17	.89	1.26	1.12	1.27	1.18	.98	1.21	0.00
25	30121	.87	1.47	.59	.86	.95	.69	.61	.77	1.18	.81	.57	.71	.77	.98	0.00
26	30122	.46	1.42	.69	.68	.55	.53	.53	.56	.90	.53	.57	.59	.52	.77	0.00
27	30130	.70	1.65	.49	.77	.86	.45	.68	.50	1.18	.59	.55	.52	.42	.80	0.00
28	30188	.68	1.60	.71	.65	.66	.69	.77	.60	1.20	.74	.57	.56	.54	.68	0.00
29	30280	.76	1.29	.67	.49	.80	.59	.75	.65	1.03	.80	.53	.51	.57	.79	0.00
30	30800	1.28	1.75	1.13	1.48	1.25	.93	1.00	1.17	1.41	1.04	.94	1.00	1.09	1.48	0.00
31	20284	.79	1.65	.53	.74	.73	.46	.59	.48	1.16	.59	.61	.59	.44	.79	0.00
32	30959	0.00	0.00	.67	.55	0.00	1.19	0.00	0.00	0.00	0.00	.70	.56	.66	.71	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	.41	0.00	0.00	0.00	0.00	.16	.63	.64	1.03	0.00
34	30123	.94	1.11	.74	.64	.67	.79	.68	.88	1.26	.96	.82	.71	.79	.82	0.00
35	127	1.07	1.51	.60	.94	.77	.62	.87	.58	1.25	.69	.68	.71	.78	.93	0.00
36	107	1.03	1.92	.80	1.02	1.19	.72	.79	.87	1.36	.85	.69	.72	.73	1.00	1.03
37	116	1.27	1.94	.79	1.01	1.08	.90	.85	.94	1.67	.93	.83	.94	.85	1.15	1.24
38	31061	.38	.74	.68	.94	.70	.45	.40	.39	.52	.36	.36	0.00	.45	.46	0.00
39	31039	1.21	1.61	.91	1.09	.95	1.01	.97	.99	1.47	1.02	.98	1.01	.90	.92	0.00
40	31314	.87	1.34	.72	1.11	.94	.60	.67	.77	1.27	.60	.75	.56	.67	.99	0.00

FIGURE D-2A

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.86	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	1.01	.86	.84	.82	1.11	1.23	1.17	1.07	.81	1.13	.46	.78	.92	.76	1.28
2	19	1.34	1.66	.67	.88	1.88	1.94	1.91	1.90	1.71	1.54	1.49	1.66	1.85	1.40	1.75
3	21	.79	.72	.60	.61	.97	.86	.88	.72	1.12	.85	.75	.50	.87	.90	1.14
4	23	.93	1.02	.95	.92	1.05	1.06	1.00	.97	1.30	1.04	.68	.77	.94	.62	1.53
5	24	1.08	1.04	.92	1.13	1.05	1.18	1.02	1.01	1.70	.97	.72	.86	.74	.82	1.41
6	112	.85	.73	.73	.70	1.07	.86	1.04	.84	1.16	.76	.74	.67	.71	.64	1.11
7	113	.85	.74	.86	.75	.91	.92	1.01	.82	1.44	.61	.82	.73	.78	.88	1.03
8	114	.80	.84	.74	.71	.80	.86	1.11	.79	1.22	.78	.59	.50	.70	.67	1.24
9	118	.84	1.19	.76	.73	1.45	1.66	1.14	1.60	1.43	1.20	.91	1.20	1.21	1.32	1.54
10	192	1.19	.93	.98	1.02	1.07	1.02	.96	.95	1.19	1.04	.72	.59	1.12	1.08	1.04
11	310	.86	.78	1.15	.92	.91	.88	.93	.77	1.40	.95	.82	.74	1.02	1.18	1.00
12	320	.84	.77	.97	.92	.93	.92	.93	.67	1.18	.76	.59	.52	.60	.57	1.00
13	330	.77	.66	.77	.79	.90	.92	1.06	.73	.99	.78	.55	.54	.55	.58	1.16
14	340	.77	.95	.57	.68	.91	1.18	1.17	.87	1.21	.99	.78	.80	.73	.81	1.49
15	20	1.00	.87	.43	.55	1.04	1.22	.97	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	---.75	.80	.84	.66	1.06	.95	1.01	.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	.75/	---.52	.54	.63	.99	.98	1.05	.78	1.00	.80	.57	.63	.87	1.04	1.11
18	195	.66	.42/	---.58	.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	.65	.62	.70/	---.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	1.05	.97	0.00	0.00/	---.77	1.09	1.05	.89	1.43	1.01	.74	.65	.89	.63	1.53
21	128	.95	.98	0.00	0.00	1.08/	---.78	1.12	1.01	1.46	.90	1.07	1.06	1.01	1.18	1.29
22	641	.99	1.05	0.00	0.00	1.03	1.12/	---.81	1.13	1.37	.81	.87	.30	.96	.99	1.02
23	125	.84	.77	0.00	0.00	.89	1.01	1.12/	---.58	1.05	1.03	.63	.51	.90	.68	1.26
24	10068	0.00	.91	0.00	0.00	.98	1.21	1.04	1.02/	---1.06	1.50	.86	.97	1.05	1.12	1.40
25	30121	0.00	.40	0.00	0.00	1.00	.87	.66	.90	1.48/	---.74	.85	.73	.73	.86	1.22
26	30122	0.00	.53	0.00	0.00	.74	1.04	.76	.62	.75	.82/	---.53	.55	.60	.48	1.01
27	30130	0.00	.60	0.00	0.00	.64	1.06	.29	.51	.87	.67	.55/	---.33	.63	.65	1.18
28	30188	0.00	.54	0.00	0.00	.82	1.00	.94	.77	1.03	.73	.47	.48/	---.59	.59	1.25
29	30280	0.00	.58	0.00	0.00	.63	1.00	.33	.59	1.12	.86	.44	.59	.57/	---.48	1.02
30	30800	0.00	1.11	0.00	0.00	1.37	1.25	.98	1.26	1.36	1.12	1.00	1.17	1.12	.87/	---.95
31	20284	0.00	.69	0.00	0.00	.92	1.01	.42	.71	.92	.60	.61	.34	.43	.65	1.07
32	30939	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.86	1.19	1.01	.77	.65	.69	.73	1.16
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.35	.96	1.16	.72	.56	.66	.88	1.05
34	30123	0.00	.69	0.00	0.00	.96	1.00	1.02	.91	1.05	.73	.69	.76	.71	.76	1.09
35	127	0.00	.81	0.00	0.00	.84	.91	.77	.84	.99	.51	.66	.63	.67	.83	1.17
36	107	.92	.86	0.00	0.00	.99	.91	1.15	.82	1.03	.49	.72	.34	.73	.80	1.17
37	116	1.08	.97	0.00	0.00	1.07	1.04	1.00	.99	1.57	.98	1.07	1.02	1.15	1.86	1.19
38	31061	0.00	.54	0.00	0.00	.11	.69	0.00	.58	.57	.21	.32	.48	.60	0.00	.53
39	31039	0.00	1.19	0.00	0.00	1.19	1.35	.79	.97	1.22	.81	1.03	.99	1.13	.86	1.29
40	31314	0.00	.72	0.00	0.00	.87	1.15	.51	.87	.76	.66	.51	.61	.73	.56	.93

FIGURE D-2B

DOPPLER NAVSAT SOLUTION NSWC820907

LATITUDE RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-105.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	.79	0.00	0.00	.94	1.08	1.05	1.29	.69	1.24	.94
2	19	1.65	0.00	0.00	1.20	1.53	1.93	1.95	2.17	1.64	1.53
3	21	.55	.76	0.00	.93	.62	.80	.79	.98	.96	.79
4	23	.77	1.19	0.00	.79	.98	1.02	1.02	1.02	1.14	1.23
5	24	.73	0.00	0.00	.88	.85	1.20	1.10	.75	.97	.98
6	112	.74	1.21	.44	.79	.67	.79	.97	.52	1.07	.77
7	113	.63	0.00	0.00	.86	.89	.79	.86	.46	1.09	.91
8	114	.48	0.00	0.00	.89	.59	.87	.94	.59	1.04	.82
9	118	1.16	0.00	0.00	1.26	1.27	1.36	1.67	.62	1.47	1.41
10	192	.59	0.00	0.00	1.02	.75	.86	.94	.56	1.04	.70
11	310	.75	.89	.52	1.17	.69	.69	.84	.48	1.00	.86
12	320	.60	.57	.63	.79	.73	.72	.95	0.00	1.03	.72
13	330	.56	.66	.64	.84	.83	.75	.88	.57	.99	.87
14	340	.79	.76	1.04	.92	.95	1.05	1.20	.53	.98	.99
15	20	0.00	0.00	0.00	0.00	0.00	1.04	1.32	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	.97	1.10	0.00	0.00	0.00
17	105	.72	0.00	0.00	.70	.84	.86	.98	.67	1.26	.91
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.92	0.00	0.00	.98	.92	1.00	1.09	.51	1.20	.95
21	128	1.01	0.00	0.00	1.00	.92	.91	1.05	1.43	1.36	1.26
22	641	.43	0.00	0.00	1.10	.81	1.17	1.01	0.00	.89	.63
23	125	.72	.86	.36	1.09	.87	.83	.99	.90	.97	.93
24	10068	1.02	1.49	.98	1.09	1.30	1.21	1.67	.66	1.51	1.08
25	30121	.65	1.01	1.16	.73	.58	.80	1.21	.70	.82	.66
26	30122	.61	.83	.73	.83	.71	.85	1.42	.61	1.10	.60
27	30130	.34	.73	.58	.88	.66	.36	1.06	.54	1.03	.70
28	30188	.59	.69	.67	.72	.78	.86	1.24	.60	1.13	.76
29	30280	.70	.73	.94	.79	.91	1.50	2.21	0.00	1.17	.57
30	30800	1.09	1.20	1.11	1.22	1.23	1.18	1.19	.70	1.31	1.31
31	20284/	---.39	.65	.63	.89	.64	.51	.89	.35	.80	.79
32	30939	.61/	---.77	.93	.97	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	.63	.92/	---.74	.93	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	.78	.96	.92/	---.73	.74	.95	1.65	0.00	.99	.91
35	127	.62	0.00	0.00	.72/	---.52	.60	.93	.36	1.01	.77
36	107	.51	0.00	0.00	.69	.55/	---.57	.95	.41	.79	.81
37	116	.85	0.00	0.00	1.07	.86	.95/	---.73	.75	1.28	1.34
38	31061	.29	0.00	0.00	0.00	.22	.35	.68/	---.53	1.20	0.00
39	31039	.78	0.00	0.00	.89	1.00	.79	1.01	.85/	---.87	1.06
40	31314	.71	0.00	0.00	.91	.75	.70	1.19	0.00	1.03/	---.64

FIGURE D-2C

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.

VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STATION NO		8	19	21	23	24	112	113	114	118	192	310	320	330	340	20
LONGITUDE		-45.87	166.67	4.36	144.63	-170.72	138.65	-106.75	-149.83	-68.76	-97.73	-68.01	-93.08	-119.07	-158.00	55.48
LATITUDE		-23.22	-77.85	50.80	13.44	-14.33	-34.67	32.28	61.28	76.54	30.38	44.40	44.73	34.11	21.52	-4.67
1	8/	---.84	1.54	1.00	1.29	1.47	.88	1.01	1.18	1.46	1.26	.99	1.13	1.14	1.18	1.16
2	19	1.54/	--1.49	1.65	1.74	1.84	1.53	1.74	1.77	1.85	1.80	1.74	1.62	1.76	1.66	1.62
3	21	.99	1.65/	---.69	1.13	1.37	.82	.78	1.05	1.58	1.11	.77	.99	1.10	1.05	.96
4	23	1.15	1.68	1.01/	--1.20	1.35	1.05	1.06	1.52	1.84	1.36	1.14	1.57	1.43	.81	1.06
5	24	1.31	1.71	1.30	1.35/	--1.45	1.24	1.45	1.75	2.08	1.66	1.53	1.86	1.67	1.39	1.32
6	112	.88	1.53	.81	.87	1.06/	---.54	.87	.99	1.47	1.09	.92	.94	1.06	1.01	.88
7	113	.99	1.73	.78	.94	1.36	.86/	---.79	1.13	1.51	1.01	.76	1.07	1.00	.93	.92
8	114	.96	1.66	.72	.95	1.26	.76	.79/	---.78	1.14	1.02	1.15	.81	1.12	1.55	1.32
9	118	1.24	1.66	1.21	1.30	1.51	1.25	1.23	1.13/	--1.12	1.36	1.69	1.11	1.51	1.69	1.04
10	192	1.24	1.79	1.08	1.18	1.50	1.08	.98	.91	1.23/	--1.00	1.08	1.21	1.22	1.33	1.35
11	310	.96	1.73	.77	1.06	1.47	.89	.75	.78	1.28	1.03/	---.77	1.03	1.01	.94	1.06
12	320	1.00	1.56	.75	1.07	1.37	.80	.84	.80	1.09	1.17	.77/	---.70	1.09	1.41	1.28
13	330	1.13	1.76	1.05	1.19	1.45	1.04	.93	.99	1.34	1.22	.93	1.06/	---.94	1.28	1.31
14	340	1.01	1.59	.95	.80	1.39	.83	.82	.90	1.13	1.12	.87	.97	1.04/	--1.07	.91
15	20	1.13	1.55	.95	1.05	1.32	.77	.89	.96	.95	1.26	1.06	1.01	1.12	.90/	---.94
16	22	1.17	1.65	1.11	.96	1.41	.88	.97	1.13	1.08	1.36	1.18	1.13	1.32	1.13	1.11
17	105	.94	1.60	.74	1.09	1.22	.66	.83	.87	1.36	1.16	.70	.74	1.03	.84	.98
18	135	.64	.49	.69	.66	.88	.56	.75	.71	.63	.55	1.05	.57	.89	.72	.87
19	196	1.12	1.35	1.20	1.26	1.50	1.03	1.17	1.23	1.09	1.29	1.08	1.16	1.09	1.20	1.06
20	27	1.11	1.97	.96	.95	1.38	1.00	.87	.94	1.37	1.17	.98	1.15	1.10	.90	1.16
21	128	1.23	2.11	.99	1.30	1.55	1.10	1.07	1.00	1.94	1.30	.99	1.06	1.31	1.17	1.41
22	641	1.07	2.02	.77	1.00	1.25	.91	.86	.97	1.21	1.08	.70	.75	1.12	.96	1.04
23	125	1.21	2.07	1.02	1.24	1.48	1.01	1.02	.83	1.76	1.11	.92	.93	1.13	1.05	1.41
24	10068	.75	1.39	.88	.98	1.23	.64	.95	1.04	1.45	1.22	.85	.88	.83	.79	0.00
25	30121	1.11	1.63	1.11	1.18	1.61	.85	.67	.73	1.33	.96	.75	1.00	.99	.64	0.00
26	30122	1.06	1.57	.87	1.01	1.14	.49	.91	.78	1.21	.93	.88	.88	.49	.71	0.00
27	30130	1.11	1.92	1.07	1.02	1.60	1.05	.75	.58	1.42	.91	.95	1.12	1.43	.75	0.00
28	30188	1.16	1.71	1.08	1.08	1.77	.93	.82	1.07	1.63	1.14	1.05	.83	1.09	.65	0.00
29	30260	.85	1.89	1.15	.83	1.56	.84	.55	.82	1.16	.93	.69	1.13	1.04	.61	0.00
30	30800	1.17	1.83	1.30	.96	1.48	.93	.85	.69	1.36	.88	.90	1.45	1.43	1.04	0.00
31	20284	.95	1.98	.76	1.02	1.52	.52	.66	.60	1.26	.69	.52	.71	.84	.65	0.00
32	30939	0.00	0.00	.71	1.09	0.00	.48	0.00	0.00	0.00	0.00	1.03	1.21	1.03	.74	0.00
33	30126	0.00	0.00	0.00	0.00	0.00	.65	0.00	0.00	0.00	0.00	.41	.86	.46	.56	0.00
34	30123	1.10	2.05	.88	1.56	1.50	.82	.75	1.05	1.21	1.24	.87	1.06	1.01	.78	0.00
35	127	1.07	2.02	.65	.96	1.57	.81	.70	.43	1.33	.73	.69	1.00	.67	.86	0.00
36	107	1.13	1.86	.89	1.22	1.44	1.05	.93	.82	2.02	1.18	.75	.92	1.07	1.04	1.57
37	116	1.19	1.79	.89	1.25	1.50	1.09	1.08	1.10	2.13	1.38	.98	1.01	1.21	1.07	1.35
38	31061	.33	.74	.54	.51	1.29	.35	.42	.35	.12	.95	.73	0.00	.30	.44	0.00
39	31039	1.43	2.42	1.38	1.13	1.76	1.14	1.49	1.13	1.73	1.09	1.18	1.25	1.10	1.43	0.00
40	31314	.92	1.91	.94	.94	1.47	.69	.69	.96	1.48	.92	.89	.88	.62	.72	0.00

FIGURE D-3A

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
STATION NO		22	105	195	196	27	128	641	125	10068	30121	30122	30130	30188	30280	30800
LONGITUDE		120.07	28.35	-64.05	110.54	141.13	-75.92	11.23	-114.29	-14.40	-78.42	-57.61	33.73	-158.00	-70.85	100.59
LATITUDE		14.99	-25.95	-64.77	-66.28	39.14	45.40	43.86	50.87	-7.91	-.10	-25.30	35.00	21.31	-33.62	13.79
1	8	1.36	.96	.69	1.12	1.15	1.37	1.08	1.25	.78	1.12	1.07	1.39	1.19	.98	1.17
2	19	1.71	1.62	.53	1.40	1.97	2.16	2.02	2.07	1.74	1.92	1.57	2.05	1.76	2.35	2.04
3	21	1.20	.74	.88	1.30	.96	1.23	.77	1.04	.92	1.13	.95	1.07	1.08	1.16	1.31
4	23	.96	1.17	1.17	1.50	1.02	1.69	1.23	1.26	1.02	1.19	1.03	1.03	1.11	.90	.97
5	24	1.41	1.35	1.08	1.55	1.38	1.88	1.29	1.49	1.25	1.61	1.20	1.94	1.82	1.59	1.51
6	112	1.06	.69	.78	1.12	1.02	1.32	.91	1.02	.70	.98	.53	1.20	1.00	.94	.94
7	113	1.13	.84	.96	1.28	.87	1.27	.86	1.05	1.02	.68	1.13	.96	.95	.76	.99
8	114	1.67	1.17	.83	1.26	1.20	1.04	1.14	.97	1.06	.76	1.01	.79	1.08	.85	.83
9	118	1.18	1.76	.79	1.19	1.62	1.98	1.71	2.07	1.45	1.34	1.21	1.45	1.67	1.19	1.36
10	192	1.58	1.21	.91	1.40	1.22	1.41	1.11	1.13	1.22	.98	1.21	1.06	1.16	.98	.96
11	310	1.24	.71	1.23	1.23	.98	1.07	.72	.94	.88	.77	.92	.96	1.06	.71	.93
12	320	1.56	.99	.81	1.20	1.31	1.23	.77	1.00	.90	1.08	.88	1.18	.83	1.14	1.52
13	330	1.71	1.12	1.02	1.14	1.20	1.32	1.20	1.32	.94	.99	.74	1.43	1.12	1.07	1.43
14	340	1.14	.89	1.32	1.51	.97	1.56	1.06	1.06	.87	.64	.76	.76	.78	.61	1.04
15	20	1.13	.99	1.06	1.17	1.20	2.34	1.08	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	22/	1.31	1.16	1.25	1.44	1.39	2.46	1.47	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	105	1.09/	.63	.92	.99	1.01	1.17	.86	.97	.66	.76	.75	1.06	.91	.85	.82
18	195	.71	.61/	.79	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	1.38	.95	1.42/	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	1.27	1.01	0.00	0.00/	.95	1.37	.96	1.12	.94	.71	1.22	1.21	.89	.62	.97
21	128	1.30	.98	0.00	0.00	1.19/	1.00	1.48	1.24	.93	.99	.88	1.43	1.13	.97	1.29
22	641	1.15	.86	0.00	0.00	.93	1.06/	.71	1.15	.84	.71	1.36	.86	1.10	.76	1.26
23	125	1.30	.97	0.00	0.00	1.11	1.09	1.07/	.88	.84	.65	.77	.83	.76	.71	1.00
24	10068	0.00	.65	0.00	0.00	.93	.84	.77	.82/	.61	1.02	.63	.81	.86	.77	1.35
25	30121	0.00	.74	0.00	0.00	.67	.93	.69	.60	.92/	.75	.88	.68	.83	.60	.93
26	30122	0.00	.75	0.00	0.00	.96	.82	1.33	.74	.62	.78/	.44	.79	.89	.56	1.11
27	30130	0.00	.60	0.00	0.00	.90	1.02	.39	.83	.81	.61	.79/	.94	.68	.61	.98
28	30188	0.00	.90	0.00	0.00	.89	1.11	.90	.76	.85	.77	.89	.68/	.76	.80	1.27
29	30280	0.00	.85	0.00	0.00	.51	.75	.67	.70	.73	.58	.54	.58	.76/	.70	1.06
30	30800	0.00	.81	0.00	0.00	.86	1.17	.93	1.00	1.31	.93	1.01	.91	1.22	1.06/	1.07
31	20284	0.00	.47	0.00	0.00	.65	.90	.57	.61	.77	.64	.66	.77	.78	.65	.90
32	30339	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.67	.81	.89	.44	.53	.88	.74	1.19
33	30126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.62	.73	.72	.59	.54	.83	.51	1.25
34	30123	0.00	.77	0.00	0.00	.76	.90	.56	.82	.81	.59	.77	1.01	.95	.64	1.22
35	127	0.00	.72	0.00	0.00	.80	1.11	.82	.62	.99	.69	.74	.73	.84	.77	.72
36	167	1.44	.92	0.00	0.00	1.02	1.00	1.00	.97	1.03	.50	1.18	.74	1.15	.61	.88
37	116	1.15	.95	0.00	0.00	1.00	1.12	.80	1.16	1.48	1.31	1.52	1.45	1.84	.98	1.33
38	31061	0.00	.38	0.00	0.00	.32	.53	0.00	.42	.33	.54	.14	.42	.54	0.00	.59
39	31039	0.00	1.10	0.00	0.00	1.46	1.64	1.01	1.18	1.21	1.43	1.25	1.13	1.37	1.12	1.23
40	31314	0.00	.67	0.00	0.00	.92	1.08	.55	1.00	.69	.81	.79	.67	.81	.96	.68

FIGURE D-3B

DOPPLER NAVSAT SOLUTION NSWC820907

HEIGHT RESIDUALS METERS

VALUES ON AND ABOVE DIAGONAL ARE RESIDUALS OF CONSTANT COORDINATES.
VALUES BELOW DIAGONAL ARE RESIDUALS FROM LINEAR FIT

STATION INDEX		31	32	33	34	35	36	37	38	39	40
STATION NO		20284	30939	30126	30123	127	107	116	31061	31039	31314
LONGITUDE		14.94	72.38	15.25	-5.72	174.10	-77.31	-1.38	-97.73	-165.12	50.61
LATITUDE		37.41	-7.26	-4.37	-15.94	52.73	39.00	51.18	30.38	69.12	26.21
1	8	1.01	0.00	0.00	1.12	1.17	1.13	1.21	.73	1.48	1.05
2	19	1.99	0.00	0.00	2.06	2.37	1.88	1.61	1.17	2.44	1.91
3	21	.76	.94	0.00	1.17	.66	.89	.89	.62	1.39	1.01
4	23	1.02	1.30	0.00	1.61	.96	1.22	1.25	.57	1.20	.98
5	24	1.55	0.00	0.00	1.61	1.57	1.44	1.51	1.52	1.83	1.59
6	112	.71	.69	.71	1.20	.90	1.05	1.09	.35	1.19	.84
7	113	.74	0.00	0.00	1.06	.70	.93	1.08	.66	1.49	.69
8	114	.68	0.00	0.00	1.28	.43	.83	1.12	.53	1.16	.96
9	118	1.30	0.00	0.00	1.30	1.34	2.07	2.18	.32	1.75	1.49
10	192	.77	0.00	0.06	1.54	.73	1.19	1.39	1.01	1.13	.92
11	310	.53	1.29	.54	.89	.73	.82	1.04	.85	1.18	.91
12	320	.78	1.27	.89	1.21	1.15	.94	1.04	0.00	1.32	1.15
13	330	.84	1.05	.46	1.06	1.45	1.27	1.37	.37	1.55	1.56
14	340	.65	.74	.63	.83	.87	1.05	1.07	.59	1.43	.72
15	20	0.00	0.00	0.00	0.00	0.00	1.57	1.35	0.00	0.00	0.00
16	22	0.00	0.00	0.00	0.00	0.00	1.50	1.21	0.00	0.00	0.00
17	105	.47	0.00	0.00	.80	.78	.93	.97	.49	1.15	.77
18	195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	196	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	27	.85	0.00	0.00	1.04	.80	1.03	1.01	.49	1.46	.92
21	128	.90	0.00	0.00	.95	1.11	1.01	1.14	.64	1.65	1.22
22	641	.56	0.00	0.00	.58	.82	1.00	.81	0.00	1.02	.58
23	125	.62	.82	.70	1.01	.62	.97	1.17	.55	1.19	1.01
24	10068	.89	.81	.85	1.10	1.01	1.04	1.49	.34	1.22	1.00
25	30121	.64	.95	.73	.61	.79	.53	1.32	.57	1.54	.81
26	30122	.73	.45	.61	.95	1.10	1.23	1.55	.17	1.26	1.04
27	30130	.77	.53	.55	1.25	.54	.90	1.53	.76	1.49	.87
28	30188	.89	1.04	.93	1.16	.93	1.16	1.86	.95	1.49	.82
29	30280	.67	.74	.55	.74	.84	.71	.99	0.00	1.53	.96
30	30800	.90	1.51	1.33	1.26	.90	.94	1.40	.59	1.23	.72
31	20284/	---.58	.63	.62	.86	.61	.84	1.41	.57	1.23	.65
32	30939	.61/	---.74	.64	.46	0.00	0.00	0.00	0.00	0.00	0.00
33	30126	.61	.61/	---.52	.80	0.00	0.00	0.00	0.00	0.00	0.00
34	30123	.79	.45	.80/	---1.01	1.14	1.09	1.52	0.00	1.63	1.19
35	127	.56	0.00	0.00	.92/	---.78	.77	1.31	.62	1.16	.81
36	107	.73	0.00	0.00	.90	.73/	---.83	1.09	.68	1.00	1.00
37	116	1.41	0.00	0.00	1.50	1.30	1.09/	---.93	1.65	1.69	1.41
38	31061	.41	0.00	0.00	0.00	.60	.36	1.65/	---.37	.90	0.00
39	31039	1.22	0.00	0.00	1.62	1.13	.99	1.64	.82/	---1.15	1.41
40	31314	.60	0.00	0.00	.96	.81	1.00	1.40	0.00	1.38/	---.83

FIGURE D-3C

APPENDIX E

INTRA-PLATE RELATIVE MOTIONS

INTRA PLATE DEFORMATIONS
NO AMERICA PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
113	NEW MEXICO	114	ALASKA	-5.1	-10.9	-25.5	1.8	1.6	1.9
113	NEW MEXICO	118	GREENLAND	10.8	9.5	-29.2	3.7	3.5	4.0
113	NEW MEXICO	192	TEXAS	-6.5	4.5	-8.2	3.1	2.4	2.6
113	NEW MEXICO	310	MAINE	-5.6	-3.1	3.5	2.3	1.8	1.8
113	NEW MEXICO	320	MINNESOTA	-10.6	2.1	-20.7	2.0	1.6	2.0
113	NEW MEXICO	330	CALIFORNIA	-8.6	4.8	-11.6	1.7	1.3	2.2
113	NEW MEXICO	128	OTTAWA	-13.4	2.0	-43.7	5.2	4.8	5.6
113	NEW MEXICO	125	CALGARY	-38.4	-4.3	19.3	7.8	5.4	6.7
113	NEW MEXICO	107	VIRGINIA	-6.9	-7.5	4.4	8.6	7.0	8.2
114	ALASKA	118	GREENLAND	16.3	14.0	-5.8	3.6	3.2	3.8
114	ALASKA	192	TEXAS	1.5	15.5	16.9	3.3	2.6	2.5
114	ALASKA	310	MAINE	1.4	7.4	28.1	2.8	1.7	1.9
114	ALASKA	320	MINNESOTA	-5.9	13.7	4.2	2.3	1.7	2.0
114	ALASKA	330	CALIFORNIA	-1.9	15.6	17.0	1.9	1.5	2.4
114	ALASKA	128	OTTAWA	-6.0	18.3	-20.5	5.9	4.5	5.4
114	ALASKA	125	CALGARY	-38.7	11.8	39.4	6.5	5.4	5.8
114	ALASKA	107	VIRGINIA	-15.1	.6	14.8	8.3	7.8	7.4
118	GREENLAND	192	TEXAS	-16.8	.3	20.0	4.7	4.3	4.5
118	GREENLAND	310	MAINE	-15.2	-8.6	36.1	4.2	3.8	4.1
118	GREENLAND	320	MINNESOTA	-22.4	-6.4	7.6	4.2	3.8	3.8
118	GREENLAND	330	CALIFORNIA	-18.8	-3.2	23.1	3.5	3.6	4.3
118	GREENLAND	128	OTTAWA	-15.4	7.4	-20.2	8.8	9.3	10.9
192	TEXAS	310	MAINE	3.7	-8.8	11.7	3.5	2.6	2.9
192	TEXAS	320	MINNESOTA	-3.4	-1.1	-11.3	3.3	2.5	3.3
192	TEXAS	330	CALIFORNIA	-2.1	.4	.5	3.2	2.4	3.4
192	TEXAS	128	OTTAWA	-13.1	-.4	-37.6	7.7	5.9	7.5
192	TEXAS	125	CALGARY	-41.6	-7.8	18.6	9.5	6.6	7.8
310	MAINE	320	MINNESOTA	-6.1	6.1	-23.1	2.5	1.7	2.0
310	MAINE	330	CALIFORNIA	-3.4	8.5	-13.3	2.4	1.8	2.3
310	MAINE	128	OTTAWA	-13.1	14.6	-29.1	6.5	4.8	5.6
310	MAINE	125	CALGARY	-28.5	7.6	16.3	9.9	5.8	6.9
310	MAINE	107	VIRGINIA	9.5	-7.0	33.5	8.6	6.1	6.7
320	MINNESOTA	330	CALIFORNIA	1.1	2.2	7.8	2.2	1.5	2.7
320	MINNESOTA	128	OTTAWA	-1.1	-.8	-39.0	6.5	4.9	5.6
320	MINNESOTA	125	CALGARY	-35.0	-9.7	24.7	5.7	[illegible].6	5.1
330	CALIFORNIA	128	OTTAWA	-7.8	-7.0	-12.2	5.4	4.7	6.8
330	CALIFORNIA	125	CALGARY	-41.2	-18.7	46.3	5.4	3.7	6.3
330	CALIFORNIA	107	VIRGINIA	-6.5	-15.6	73.0	9.2	6.8	9.9
128	OTTAWA	125	CALGARY	-26.9	-11.0	51.7	9.9	7.6	8.2
128	OTTAWA	107	VIRGINIA	15.5	-5.6	16.4	9.6	6.0	8.7
	WEIGHTED MEAN OF ABSOLUTE RATES			-4.7	1.2	.3			
	STANDARD ERROR OF WEIGHTED MEAN			.7	.5	.8			

DOPPLER NAVSAT SOLUTION NSWC820907

FIGURE E-1

INTRA PLATE DEFORMATIONS
SO AMERICA PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
WEIGHTED MEAN OF ABSOLUTE RATES				-4.1	4.0	7.0			
STANDARD ERROR OF WEIGHTED MEAN				2.8	1.9	2.0			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
PACIFIC PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
24	SAMOA	340	HAWAII	3.2	-12.8	-2.5	3.6	2.4	3.6
WEIGHTED MEAN OF ABSOLUTE RATES				-14.7	2.3	26.4			
STANDARD ERROR OF WEIGHTED MEAN				1.9	1.3	2.0			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
EURASIAN PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
21	BELGIUM	27	JAPAN	-5.8	-9.8	2.6	3.2	2.8	2.8
21	BELGIUM	641	ITALY	3.5	4.0	-.5	5.1	4.5	4.8
27	JAPAN	641	ITALY	11.9	10.0	-18.3	6.2	5.6	5.1
20130	CYPRUS	20284	CATANIA	6.4	-2.6	9.3	6.7	4.6	10.3
WEIGHTED MEAN OF ABSOLUTE RATES				1.5	.8	12.9			
STANDARD ERROR OF WEIGHTED MEAN				1.2	.9	1.2			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
PHILIPPINE PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
23	GUAM	22	PHILIPPINES	11.3	1.8	.3	4.2	3.4	3.5
WEIGHTED MEAN OF ABSOLUTE RATES				-3.5	-.5	27.9			
STANDARD ERROR OF WEIGHTED MEAN				1.8	1.5	2.4			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
AUSTRALIAN PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
WEIGHTED MEAN OF ABSOLUTE RATES				-5.5	17.0	7.1			
STANDARD ERROR OF WEIGHTED MEAN				1.5	1.6	1.3			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
ANTARCTIC PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
WEIGHTED MEAN OF ABSOLUTE RATES				-1.3	.7	9.2			
STANDARD ERROR OF WEIGHTED MEAN				4.1	4.1	4.0			

DOPPLER NAVSAT SOLUTION NSWC820907

INTRA PLATE DEFORMATIONS
AFRICAN PLATE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
20	SEYCHELLES	105	SO AFRICA	3.2	10.9	-3.7	4.1	3.1	3.9
WEIGHTED MEAN OF ABSOLUTE RATES				-1.5	5.6	15.7			
STANDARD ERROR OF WEIGHTED MEAN				1.4	1.3	1.5			

DOPPLER NAVSAT SOLUTION NSWC820907

FIGURE E-2

APPENDIX F

INTER-PLATE RELATIVE MOTIONS

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO EURASIAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
113	NEW MEXICO	27	JAPAN	-3.9	-11.5	1.6	3.1	2.5	2.5
113	NEW MEXICO	641	ITALY	11.3	.1	-2.3	5.5	5.1	4.4
114	ALASKA	27	JAPAN	4.2	5.1	29.2	3.2	2.4	2.8
114	ALASKA	641	ITALY	26.8	19.7	28.8	6.0	5.8	5.4
118	GREENLAND	27	JAPAN	-15.7	-18.7	30.6	4.7	5.1	5.2
118	GREENLAND	641	ITALY	-5.8	.1	51.2	9.2	8.5	9.0
192	TEXAS	27	JAPAN	-4.7	-16.1	14.7	4.4	3.6	4.2
192	TEXAS	641	ITALY	3.4	-12.1	11.2	7.6	5.4	6.3
310	MAINE	27	JAPAN	-5.4	-2.3	.7	3.7	2.8	3.0
310	MAINE	641	ITALY	-2.0	14.7	8.0	6.8	4.9	3.9
320	MINNESOTA	27	JAPAN	2.8	-13.5	23.6	3.5	2.7	3.6
320	MINNESOTA	641	ITALY	18.2	-2.3	7.1	5.9	4.8	3.9
320	MINNESOTA	30130	CYPRUS	7.7	-1.4	30.5	9.3	7.3	15.8
320	MINNESOTA	20284	CATANIA	20.0	4.7	25.8	9.3	8.1	9.6
330	CALIFORNIA	27	JAPAN	6.3	-17.0	18.7	3.4	2.4	3.4
330	CALIFORNIA	641	ITALY	14.4	-8.2	20.3	5.9	5.4	5.8
128	OTTAWA	641	ITALY	18.3	-.7	53.2	7.5	6.8	6.4
113	NEW MEXICO	21	BELGIUM	.6	1.0	-.2	2.0	1.6	1.8
114	ALASKA	21	BELGIUM	6.7	12.3	25.0	2.3	1.6	1.7
118	GREENLAND	21	BELGIUM	-9.6	-4.0	34.2	3.7	3.3	4.0
192	TEXAS	21	BELGIUM	5.9	-4.9	9.1	3.4	2.3	3.0
310	MAINE	21	BELGIUM	5.6	4.8	-2.2	2.4	1.7	1.8
320	MINNESOTA	21	BELGIUM	11.1	-1.8	20.5	2.3	1.6	1.8
330	CALIFORNIA	21	BELGIUM	9.9	-3.8	11.3	2.2	1.7	2.5
128	OTTAWA	21	BELGIUM	16.2	-9.8	48.4	5.8	4.4	5.1
128	OTTAWA	27	JAPAN	10.4	-8.4	45.6	6.7	5.9	6.4
125	CALGARY	21	BELGIUM	40.4	-.7	-15.8	7.8	4.6	6.5
125	CALGARY	27	JAPAN	40.8	-4.3	-12.9	9.1	6.0	7.5
125	CALGARY	641	ITALY	70.2	7.7	-23.9	9.6	8.1	7.8
107	VIRGINIA	21	BELGIUM	12.3	-6.8	-.2	7.9	7.0	7.7

FIGURE F-1

AD-A120 534 CURRENT PLATE MOTIONS BASED ON DOPPLER SATELLITE OBSERVATIONS(U) NAVAL SURFACE WEAPONS CENTER DAHLGREN VA R J ANDERLE ET AL. SEP 82 NSWC/TR-82-369 2/2

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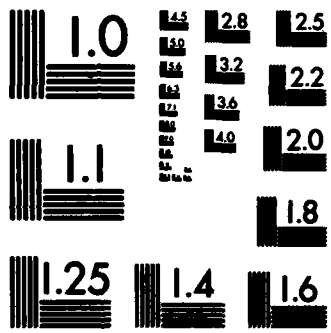

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO SO AMERICA

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	8	BRAZIL	-2.4	4.4	-5.4	3.1	2.3	2.4
114	ALASKA	8	BRAZIL	1.4	14.7	21.6	3.2	2.1	2.5
118	GREENLAND	8	BRAZIL	-19.0	-1.9	26.3	4.7	3.7	4.4
192	TEXAS	8	BRAZIL	.5	-1.9	6.5	4.7	3.1	3.5
310	MAINE	8	BRAZIL	2.9	8.3	-7.1	3.9	2.4	2.4
320	MINNESOTA	8	BRAZIL	7.0	1.0	16.1	3.5	2.2	2.6
330	CALIFORNIA	8	BRAZIL	4.5	-1.2	3.8	3.3	2.1	2.9
128	OTTAWA	8	BRAZIL	7.0	13.8	40.8	9.7	7.3	7.5

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO PACIFIC

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	340	HAWAII	-14.1	-3.7	14.1	2.4	2.1	2.0
114	ALASKA	340	HAWAII	-8.5	8.0	40.3	2.6	1.9	2.2
118	GREENLAND	340	HAWAII	-25.4	-8.8	43.6	4.2	3.6	4.0
192	TEXAS	340	HAWAII	-6.3	-7.9	24.7	3.8	3.0	3.1
310	MAINE	340	HAWAII	-9.4	1.2	11.8	3.2	2.2	2.1
320	MINNESOTA	340	HAWAII	-4.0	-6.1	34.4	2.8	2.0	2.5
330	CALIFORNIA	340	HAWAII	-4.7	-8.7	25.7	2.6	2.0	2.6
113	NEW MEXICO	24	SAMOA	-18.0	6.5	16.8	3.3	2.6	3.3
114	ALASKA	24	SAMOA	-11.7	18.9	39.9	3.6	2.3	3.2
118	GREENLAND	24	SAMOA	-30.0	3.9	51.2	5.2	4.9	5.8
192	TEXAS	24	SAMOA	-11.5	2.6	25.6	4.3	3.4	4.3
310	MAINE	24	SAMOA	-12.8	10.9	14.0	3.6	2.6	3.7
320	MINNESOTA	24	SAMOA	-8.7	3.2	39.4	3.4	2.8	3.5
330	CALIFORNIA	24	SAMOA	-10.6	1.0	27.2	3.5	2.6	3.6
128	OTTAWA	24	SAMOA	3.9	-4.7	68.0	8.4	6.3	8.2
128	OTTAWA	340	HAWAII	6.7	-1.4	62.1	6.8	6.0	6.0
125	CALGARY	24	SAMOA	28.0	1.3	10.4	9.9	6.6	9.7
125	CALGARY	340	HAWAII	38.2	-2.6	9.7	7.2	4.9	6.0

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO PHILIPPINE

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	22	PHILIPINES	-.1	-.5	16.2	3.0	2.7	3.1
114	ALASKA	22	PHILIPINES	4.3	10.4	37.1	3.0	2.6	4.0
118	GREENLAND	22	PHILIPINES	-7.9	2.5	24.8	6.8	6.2	7.9
192	TEXAS	22	PHILIPINES	13.9	-5.4	25.9	5.0	4.8	5.5
310	MAINE	22	PHILIPINES	7.5	1.8	11.1	4.1	2.9	4.0
320	MINNESOTA	22	PHILIPINES	12.2	-2.6	31.1	3.1	2.8	3.8
330	CALIFORNIA	22	PHILIPINES	8.0	-4.5	31.8	3.3	2.5	4.5
113	NEW MEXICO	23	GUAM	-11.1	-1.2	16.0	2.7	2.3	2.3
114	ALASKA	23	GUAM	-5.0	9.8	40.3	2.9	2.2	2.4
118	GREENLAND	23	GUAM	-20.9	-6.7	44.3	4.5	4.3	4.5
192	TEXAS	23	GUAM	-4.0	-4.9	25.1	4.1	3.2	3.5
310	MAINE	23	GUAM	-5.3	2.4	14.5	3.4	2.3	2.8
320	MINNESOTA	23	GUAM	-.3	-3.2	37.9	3.2	2.2	2.8
330	CALIFORNIA	23	GUAM	-1.7	-6.5	27.1	2.9	2.3	3.1
128	OTTAWA	23	GUAM	7.4	-2.8	70.6	7.5	5.7	6.9
128	OTTAWA	22	PHILIPINES	12.7	-5.1	82.6	6.8	5.4	7.3
125	CALGARY	23	GUAM	36.8	.1	14.0	8.8	6.2	7.9
125	CALGARY	22	PHILIPINES	56.2	.5	16.1	8.0	6.0	9.3

FIGURE F-2

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO AUSTRALIAN

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	112	AUSTRALIA	-7.0	15.2	-5.2	1.7	1.5	2.1
114	ALASKA	112	AUSTRALIA	-.2	25.8	20.4	2.1	1.5	1.9
118	GREENLAND	112	AUSTRALIA	-10.2	8.6	26.2	3.8	3.4	4.2
192	TEXAS	112	AUSTRALIA	1.0	10.7	4.2	3.3	2.4	3.1
310	MAINE	112	AUSTRALIA	-2.1	19.2	-7.4	2.3	1.7	2.2
320	MINNESOTA	112	AUSTRALIA	3.8	13.0	15.8	2.3	1.6	2.1
330	CALIFORNIA	112	AUSTRALIA	1.3	9.3	6.1	1.9	1.4	2.6
128	OTTAWA	112	AUSTRALIA	7.3	14.9	47.2	5.4	4.4	5.8
125	CALGARY	112	AUSTRALIA	34.8	27.0	-9.2	6.3	4.6	6.2
107	VIRGINIA	112	AUSTRALIA	1.7	32.1	-6.9	8.4	6.3	9.2

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO AFRICAN

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	20	SEYCHELLES	-5.6	-4.1	6.9	3.5	3.3	3.4
113	NEW MEXICO	105	SO AFRICA	-.7	7.9	4.0	2.0	1.8	2.2
114	ALASKA	20	SEYCHELLES	-1.0	9.4	30.9	3.9	3.1	4.2
114	ALASKA	105	SO AFRICA	3.1	17.0	27.5	2.0	1.9	2.4
118	GREENLAND	20	SEYCHELLES	-14.0	-6.8	23.2	7.6	6.1	7.5
118	GREENLAND	105	SO AFRICA	-11.8	2.1	35.9	4.1	4.0	4.5
192	TEXAS	20	SEYCHELLES	9.2	-14.9	16.7	6.4	4.7	6.0
192	TEXAS	105	SO AFRICA	8.1	1.9	14.0	3.6	2.9	3.6
310	MAINE	20	SEYCHELLES	.4	-.4	2.2	4.7	3.5	4.1
310	MAINE	105	SO AFRICA	7.4	10.2	3.3	2.6	2.0	1.9
320	MINNESOTA	20	SEYCHELLES	4.8	-3.2	25.3	4.1	3.2	4.1
320	MINNESOTA	105	SO AFRICA	10.0	4.5	22.7	2.3	2.1	2.0
330	CALIFORNIA	20	SEYCHELLES	3.3	-7.9	22.1	3.3	3.1	4.4
330	CALIFORNIA	105	SO AFRICA	6.4	2.9	15.9	2.0	1.8	2.8
128	OTTAWA	20	SEYCHELLES	10.9	-7.4	71.1	8.8	7.0	8.2
128	OTTAWA	105	SO AFRICA	16.5	2.9	43.0	5.9	5.5	5.5
125	CALGARY	105	SO AFRICA	31.8	11.4	-.1	7.6	5.6	7.0
107	VIRGINIA	105	SO AFRICA	10.9	8.1	-11.3	8.4	7.5	8.1

RELATIVE PLATE MOTIONS
FROM NO AMERICA TO ANTARCTIC

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
113	NEW MEXICO	19	MCMURDO	2.2	1.7	-5.3	4.7	4.4	4.8
114	ALASKA	19	MCMURDO	6.8	9.8	21.5	4.7	4.7	4.6
118	GREENLAND	19	MCMURDO	-10.9	-9.1	26.6	6.1	5.8	5.8
192	TEXAS	19	MCMURDO	10.5	-5.3	4.8	5.9	5.8	5.8
310	MAINE	19	MCMURDO	7.7	4.1	-8.5	5.3	4.5	5.0
320	MINNESOTA	19	MCMURDO	9.8	1.3	14.9	5.1	4.7	4.6
330	CALIFORNIA	19	MCMURDO	8.5	-1.2	-.0	4.9	4.6	5.8

FIGURE F-3

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM EURASIAN TO PHILIPPINE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
21	BELGIUM	23	GUAM	-10.3	-2.9	17.8	2.8	2.3	2.6
21	BELGIUM	22	PHILIPINES	-2.5	-2.9	13.4	3.4	2.6	3.7
27	JAPAN	23	GUAM	-9.2	6.8	14.3	4.1	3.3	3.8
27	JAPAN	22	PHILIPINES	4.1	2.8	16.5	3.7	3.9	4.7
641	ITALY	23	GUAM	-20.0	2.1	32.3	7.0	5.5	5.4
641	ITALY	22	PHILIPINES	-13.6	-7.5	32.9	6.5	6.9	8.8

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM EURASIAN TO AUSTRALIAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
21	BELGIUM	112	AUSTRALIA	-6.4	13.7	-4.8	1.8	1.7	2.8
27	JAPAN	112	AUSTRALIA	.8	25.1	-8.2	3.4	2.6	3.8
641	ITALY	112	AUSTRALIA	-15.8	14.6	.1	5.7	5.3	4.9
116	ENGLAND	112	AUSTRALIA	-11.1	35.1	-4.1	9.8	8.3	18.8

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM EURASIAN TO ANTARCTIC

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
21	BELGIUM	19	MCMURDO	-.6	.1	-3.5	5.8	4.4	4.6
27	JAPAN	19	MCMURDO	1.4	13.9	-5.3	7.4	7.0	7.4

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM EURASIAN TO AFRICAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
21	BELGIUM	20	SEYCHELLES	-8.3	-4.9	4.6	3.6	3.1	3.7
21	BELGIUM	105	SO AFRICA	-3.1	6.2	2.5	2.4	1.9	2.8
27	JAPAN	20	SEYCHELLES	-3.1	4.8	9.3	5.6	4.3	4.9
27	JAPAN	105	SO AFRICA	.9	18.8	-.5	4.3	3.9	4.1
641	ITALY	20	SEYCHELLES	-14.5	-17.2	11.1	7.7	7.3	8.9
641	ITALY	105	SO AFRICA	-9.2	2.4	.8	6.4	5.7	4.7
116	ENGLAND	105	SO AFRICA	-3.5	11.9	-16.1	9.9	8.6	8.4

RELATIVE PLATE MOTIONS
FROM AUSTRALIAN TO ANTARCTIC

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
112	AUSTRALIA	19	MCMURDO	9.5	-12.9	4.1	4.3	4.3	4.4

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM AUSTRALIAN TO AFRICAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
112	AUSTRALIA	20	SEYCHELLES	-2.3	-16.8	14.4	4.1	3.4	3.3
112	AUSTRALIA	105	SO AFRICA	6.7	-8.1	6.4	2.1	1.9	1.8

RELATIVE PLATE MOTIONS
FROM ANTARCTIC TO AFRICAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
19	MCMURDO	20	SEYCHELLES	-12.0	2.9	18.1	7.8	7.9	8.6
19	MCMURDO	105	SO AFRICA	-1.1	9.2	8.9	5.3	5.3	5.2

FIGURE F-4

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SO AMERICA TO PACIFIC

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	24	SAMOA	-12.6	5.7	28.9	4.3	3.1	3.4
8	BRAZIL	348	HAWAII	-9.6	-5.5	18.6	3.3	2.3	2.6

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SO AMERICA TO EURASIAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	21	BELGIUM	4.1	-2.1	8.1	3.2	2.2	2.5
8	BRAZIL	27	JAPAN	-.4	-17.8	11.8	4.4	3.1	3.4
8	BRAZIL	641	ITALY	28.8	-7.6	8.8	9.7	7.1	6.5

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SO AMERICA TO PHILIPPINE

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	23	GUAM	-9.9	-5.1	19.6	3.7	2.7	3.8
8	BRAZIL	22	PHILIFINES	2.4	-3.6	21.2	3.9	3.6	4.2

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SO AMERICA TO AUSTRALIAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	112	AUSTRALIA	-2.5	11.7	.2	3.8	2.2	2.3

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SC AMERICA TO ANTARCTIC

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	19	MCMURDO	2.6	1.7	-1.8	5.9	5.2	4.6

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM SO AMERICA TO AFRICAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
8	BRAZIL	20	SEYCHELLES	-5.1	-5.5	18.8	5.1	3.8	4.8
8	BRAZIL	105	SO AFRICA	2.8	3.8	7.1	3.7	2.4	2.6

FROM PHILIPPINE TO AUSTRALIAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
23	GUAM	112	AUSTRALIA	4.6	17.6	-28.1	2.9	2.8	2.3
22	PHILIPINES	112	AUSTRALIA	-5.1	14.1	-17.7	2.8	2.5	3.1

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM PHILIPPINE TO ANTARCTIC

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
23	GUAM	19	MCMURDO	7.9	5.3	-16.3	5.9	5.2	5.8
22	PHILIPINES	19	MCMURDO	-2.2	-2.2	-15.4	6.4	6.7	8.3

DOPPLER NAVSAT SOLUTION NSWC820987

RELATIVE PLATE MOTIONS
FROM PHILIPPINE TO AFRICAN

REF STA	LOCATION	TO STA	LOCATION	RATES (CM/YR) LONG	LAT	HEIGHT	STANDARD ERRORS LONG	LAT	HEIGHT
23	GUAM	20	SEYCHELLES	1.6	-.1	-4.2	4.3	4.1	4.5
23	GUAM	105	SO AFRICA	6.2	7.5	-16.8	3.3	2.9	3.2
22	PHILIPINES	105	SO AFRICA	-2.4	7.2	-11.4	3.2	2.6	3.7
22	PHILIPINES	20	SEYCHELLES	-6.9	-.8	-6.8	3.1	3.6	4.8

DOPPLER NAVSAT SOLUTION NSWC820987

FIGURE F-5

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM PACIFIC TO EURASIAN

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
24	SAMOA	27	JAPAN	7.9	-9.6	-1.2	4.2	3.1	4.2
24	SAMOA	641	ITALY	19.6	6.8	-14.2	8.0	5.3	6.6
340	HAWAII	27	JAPAN	11.6	-3.9	-13.8	3.9	2.7	2.7
340	HAWAII	641	ITALY	25.6	8.9	-20.0	6.5	6.2	5.2
24	SAMOA	21	BELGIUM	17.7	-4.6	-14.4	3.3	2.5	3.2
340	HAWAII	21	BELGIUM	14.3	5.5	-14.5	2.7	2.1	2.3

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM PACIFIC TO PHILIPPINE

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
24	SAMOA	22	PHILIPINES	24.1	-12.8	-.5	5.1	3.6	5.0
340	HAWAII	22	PHILIPINES	17.5	1.4	3.5	3.3	2.9	4.2
24	SAMOA	23	GUAM	6.2	-8.1	.4	3.7	2.9	3.6
340	HAWAII	23	GUAM	3.4	1.6	1.0	2.9	2.5	2.1

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM PACIFIC TO AUSTRALIAN

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
24	SAMOA	112	AUSTRALIA	12.0	9.1	-20.7	3.1	2.7	2.7
340	HAWAII	112	AUSTRALIA	8.3	19.9	-18.9	2.5	2.1	2.1

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM PACIFIC TO ANTARCTIC

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
24	SAMOA	19	MCMURDO	22.6	-6.4	-23.2	5.0	5.2	5.0
340	HAWAII	19	MCMURDO	15.6	5.6	-15.5	4.0	4.4	4.5

DOPPLER NAVSAT SOLUTION NSWC820907

RELATIVE PLATE MOTIONS
FROM PACIFIC TO AFRICAN

				RATES (CM/YR)			STANDARD ERRORS		
REF STA	LOCATION	TO STA	LOCATION	LONG	LAT	HEIGHT	LONG	LAT	HEIGHT
24	SAMOA	20	SEYCHELLES	12.6	-15.7	-5.0	5.7	4.7	5.5
24	SAMOA	105	SO AFRICA	17.1	-6.1	-21.0	3.7	2.9	3.4
340	HAWAII	20	SEYCHELLES	5.3	-2.0	-4.9	4.1	3.3	4.1
340	HAWAII	105	SO AFRICA	10.7	8.2	-9.3	2.6	2.5	2.3

FIGURE F-6

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